CONVENTION NUMBER

TEXTILE WORLD RECORD

MAY, 1914

MECHANICS BUILDING, BOSTON, IN WHICH WAS HELD, FROM APRIL 27TH TO MAY 2ND, THE LARGEST AND MOST COMPREHENSIVE EXHIBITION OF TEXTILE MACHINERY EVER CONDUCTED

LIBRARY OF CONGRESS

LORD & NAGLE COMPANY, *Boston, Mass.*

The TEXTILE-FINISHING MACHINERY CO.

Howard Building, Providence, R. I.

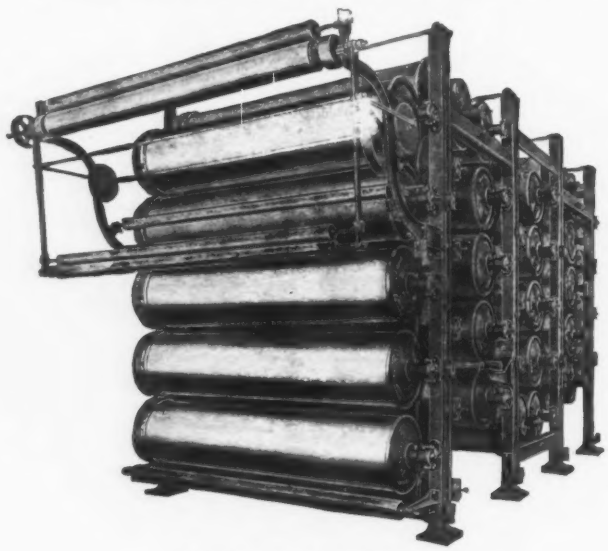
BUILDERS OF

Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Machinery

FOR

TEXTILE FABRICS AND WARPS

Plans and Estimates for Complete Plants



Upright Drying Machine

ALL KINDS OF

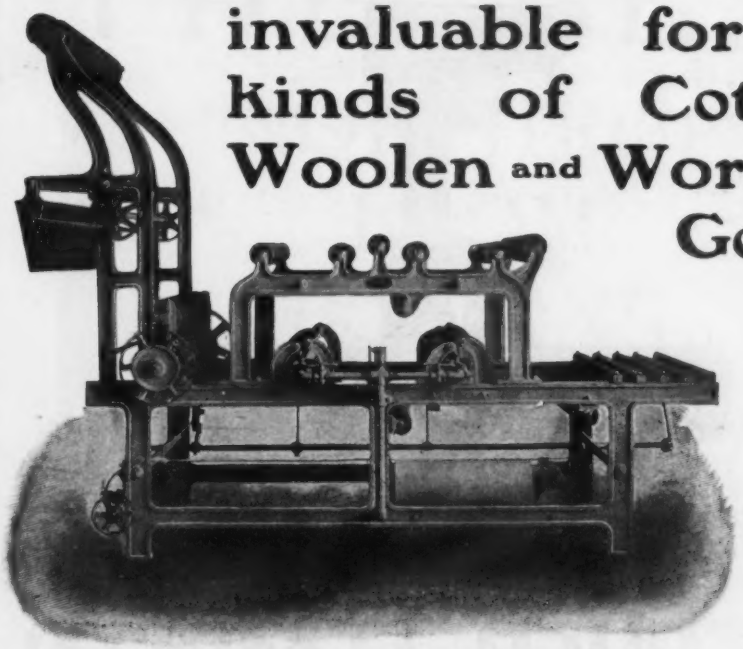
Horizontal and Upright Drying Machines

With cylinders made from either the best English tinned iron or best Lake Superior sheet copper, fitted with our

Patent Spiral Scoops

Dryers especially designed for narrow fabrics, cotton, woolen and worsted goods and cotton warps

A Singeing Machine that's invaluable for all kinds of Cotton, Woolen and Worsted Goods



Note its many special advantages

The face and back of cloth can be singed at same operation.

Extreme facility of working, as the cloth is always seen by the operator, and the flame can be removed and machine stopped instantly, thus avoiding any chance of damaging the goods.

Two pieces can be singed at one time in the same machine. The width of the flame is limited exactly to the width of the goods, thus preventing any waste of gas.

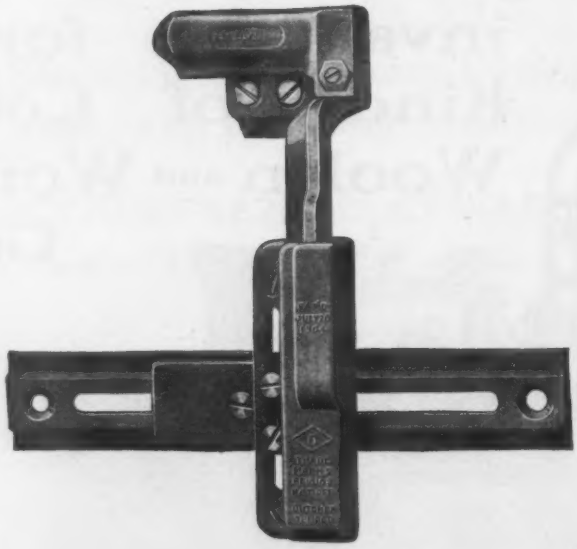
Compressed air is delivered into a large receiver, and the gas and air mixed at a uniform pressure, insuring a steady and perfect flame.

The combustion being complete, not the least trace of soot can be found even on the most delicate goods.

H. W. BUTTERWORTH & SONS CO.

PHILADELPHIA, PA.

BLEACHING, DYEING, DRYING AND FINISHING MACHINERY FOR SILK, COTTON AND WORSTED FABRICS.



DUTCHER TEMPLES

Trade Mark Reg. U. S. Pat. Off.

DRAPER COMPANY

SOLE MANUFACTURERS

HOPEDALE MASS.

THE BEST

NORTHROP LOOM BOBBINS

AND

SHUTTLES

ARE MADE BY

Northrop Loom Manufacturers

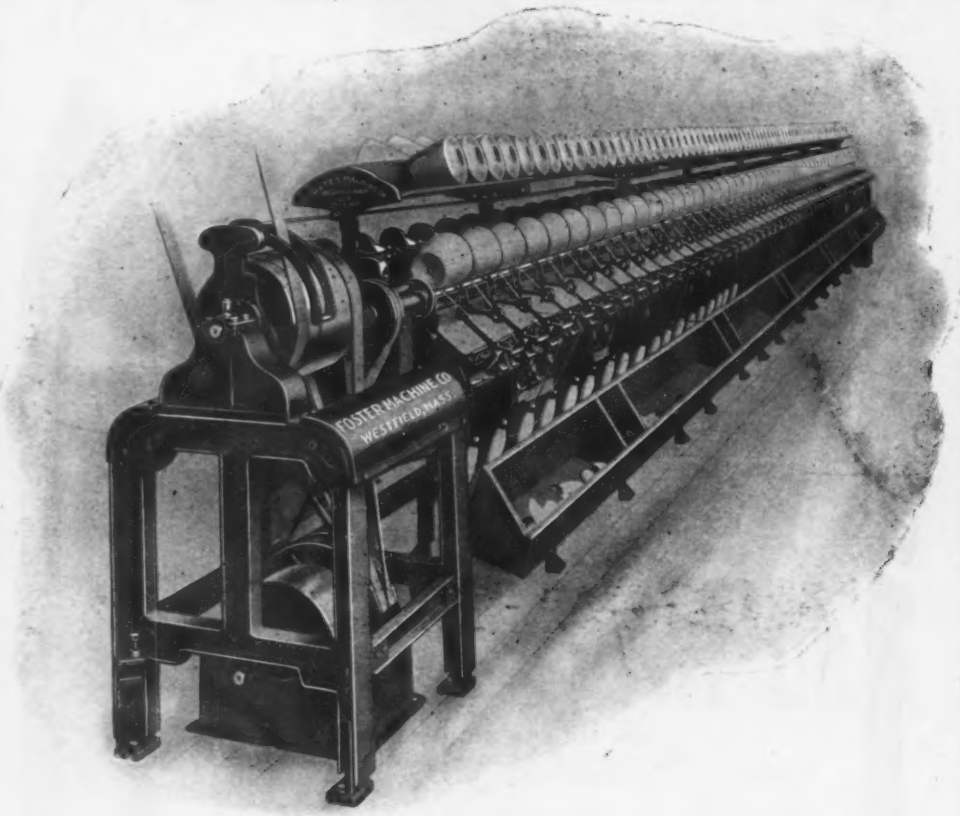
Look for our name on your
Shuttles and Bobbins

DRAPER COMPANY

Hopedale Mass.

J. D. CLOUDMAN Southern Agent 40 So. Forsyth St. Atlanta Ga.

Foster Machine Co.



The Foster Model 12 differential attachment spaces the yarn on the cone in winding so as to secure in the Knitting process a light unwinding tension that does not change from start to finish of cone. ¶ This is *one* of the exclusive features that has made the Foster Finished cone acceptable to all Knitters.

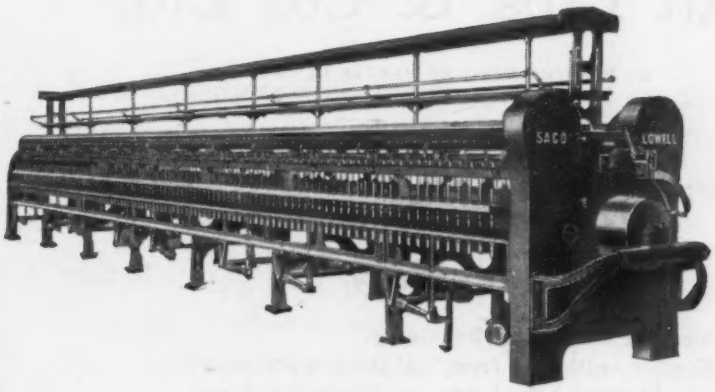
Office and Works

Westfield, - - Massachusetts

John Hill, So. Agent, Third National Bank Bldg., Atlanta, Ga.

Saco-Lowell Shops

TEXTILE MACHINERY



Shops—
Lowell, Mass.
Biddeford, Maine
Newton Upper Falls, Mass.

Executive Offices—
77 Franklin Street
Boston, Mass.

Southern Agent, ROGERS W. DAVIS,
Charlotte, N. C.

COMPLETE COTTON MILL EQUIPMENT
Including:
Pickers
Cards
Drawing
Evener Drawing
Roving
Spinning
Twisters
Slashers
Spoolers
Reels
Winders
Warpers
Looms

WASTE RECLAIMING MACHINERY

WORSTED MACHINERY
Including:
Revolving Creels,
Gill Boxes
Drawing Frames,
Reducing and Roving Frames,
Cap Ring and Flyer Spinning and Twisting Frames
Jack Spoolers

LEIGH & BUTLER

SUCCESSORS TO

EVAN ARTHUR LEIGH

232 Summer Street opposite the South Station), Boston, Mass.

SOLE AGENTS

IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen & Worsted Machinery

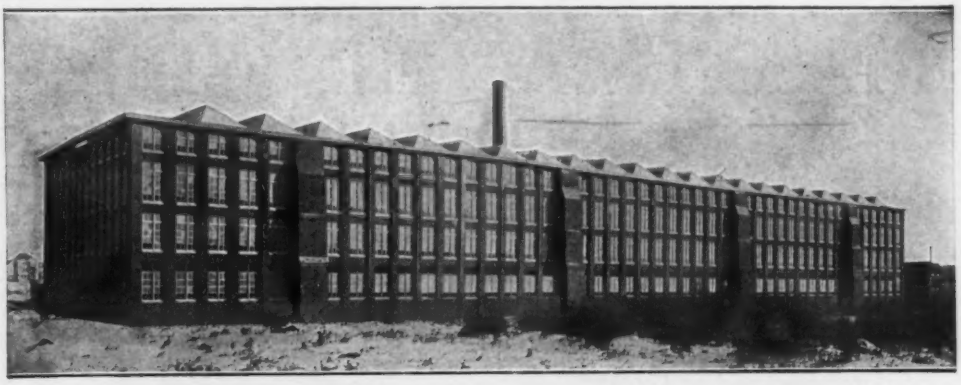
Platt's Patent Opening and Picking Machinery.
Platt's Cotton Comber—will comb from 7-8" stock to Sea Islands.
Platt's Special Machinery for Making Cotton Wastes into Yarns.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.
Platt's Cotton, Cotton Waste, Woolen and Worsted Mules.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery

Archbutt-Deeley System for purifying and softening water.

JOSEPH SYKES BROS. Card Clothing for Cotton.
JAMES CRITCHLEY & SONS. Card Clothing for Woolen and Worsted.
WILSON BROS. BOBBIN CO. Bobbins, Shuttles, Etc.
THOMAS B. HAIGH. Double Loop Bands, Spinning Tape, Etc.
DRONSFIELD BROTHERS. Grinding Machinery and Emery Filleting.
HARDING'S Fallers, Pins and Circles.
The Best French and English Combing and Rubbing Aprons.
Card Flats reclothed and Lickers-in rewound.



Sharp Manufacturing Company, New Bedford, Mass.

Your business is operating a mill, so there is no particular reason why you should take the responsibility of the size of the humidifying equipment to be furnished.

Therefore, insist upon having a guarantee to give you the desired results during ***all seasons.***

The CARRIER SYSTEM is guaranteed to give the required results continuously—temperature as well as humidity. ***Cooling in summer; heating in winter; humidifying all the time.***

Have Your Mill "CARRIER EQUIPPED"

Carrier Air Conditioning Co.

Of America

No. 39 Cortlandt Street, New York City

BUFFALO, 490 Broadway

BOSTON
Weld Building
176 Federal Street

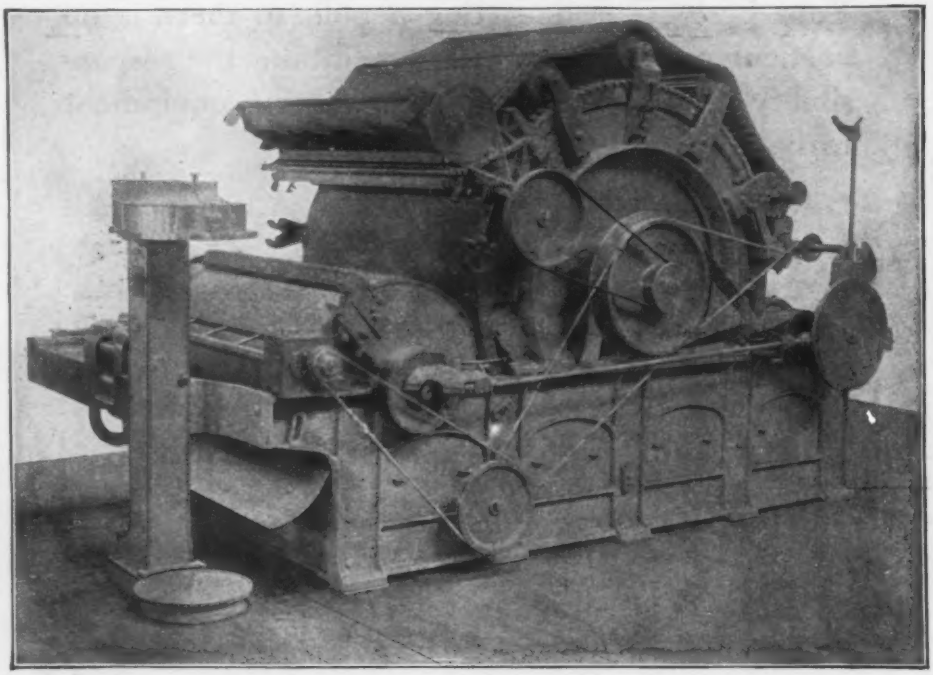
CHICAGO
Ft. Dearborn Bldg.
Clark and Monroe Sts.

PHILADELPHIA
732 Real Estate Trust Bldg.

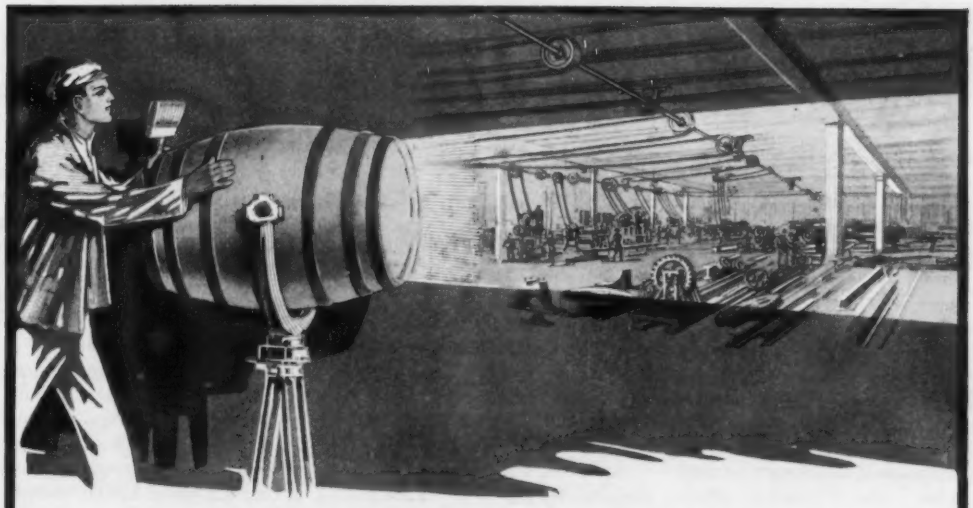
MASON MACHINE WORKS

Taunton, Mass. **Greenville, S. C.**

Builders of
Revolving Flat Cards, Drawing Frames,
Spinning Frames, Looms, Dobbies, Etc.



Superior Loom Cranks for Repairs



Are you getting the maximum amount of daylight in your plant?

Or is a large percentage absorbed, swallowed up, *wasted*, in your ceiling and walls? The difference can be reduced to dollars and cents—in your lighting bills, the efficiency of your employees, the quality of your product.

RICE'S MILL WHITE

will fill your factory with sunshine. It will reflect every ray of your natural or artificial light down on to your machinery and into the dark corners of your plant. Its glossy, tile-like surface will not absorb light or collect dirt, germs and odors like a flat paint. It can be washed like tile.

Rice's Mill White will not scale and require frequent renewals like a cold-water paint. It will not "alligator" and crack under the jar of machinery like a varnish paint. It flows easily under a 4-inch brush; two coats equal three of lead and oil. *It stays white longer than any other gloss paint.*

The Original Mill White

Rice's Mill White made a trade name of the words, "Mill White." It has no substitute. None of its imitations has its elastic, permanent qualities. No other paint manufacturer can use the Rice process. Rice's Mill White for ten years has proved itself unequalled for illuminating power, sanitary qualities and low ultimate cost.

Write for Booklet and Sample Board

Ask for a copy of our booklet,
"More Light." WRITE TODAY

U. S. GUTTA PERCHA PAINT CO.

No. 20 Dudley Street **Providence, R. I.**

Parks' Piping Parables

Some years ago we commenced to feel that if piping were to come to its own, it would have to be built up along different lines from the then accepted order of things.

We commenced to advertise.

There is one good thing about advertising that some of the non-believers overlook. You have got to make good or get out.

Say what you will then advertising pays.

Also—in our case Bert Thompson heard of us and we got hitched up to his Turbo Humidifier which launched us into the specialty field.

More piping but different problems.

I sometimes wonder at our nerve when in that sad time of 1908 we had the temerity to buck the center with a new and unknown specialty, but here we are in 1914 doing the very same thing—that I'll tell you about later.

During 1908 we had all the symptoms of business sea-sickness:—everything going out and nothing coming in, but along in 1909 we commenced to make a dent in the humidifier business until—may I say it—"turbofied" and "satisfied" have come to have a few common attributes.

Let them as is "turbofied" speak.

One thing more before I go on. We found there were a lot of things we didn't know about textile mills in general and humidifying in particular

And that had some virtue because it necessitated our finding out—and also finding the price to find out with.

Investigation led to compressed air cleaning. More piping; more problems.

You see the Turbo uses compressed air (some kind friends say hot air but we'll pass that) as a motive of force. Some mills had previously found out the virtues in giving their machinery a blowing up—or down—with compressed air, but it remained for us to combine the two into one complete equipment.

Which we did.

In our system, compressed air cleaning is a sort of by-product and the two systems together cost the consumer less than just plain humidifying did before we entered the field.

So let us take off our hat—to competition.

But this story of what we do and how we do it isn't to be confined to those two specialties.

I started to mention them—in passing—but we seem to have as hard a time passing them as a Packard does a motorcycle.

What do we do?

Did you ever study a piping bill? You would say—"Great Ceasar—how do they do it and retain sanity?"

Gallery says—"They don't."

Years ago when the piping business was young, the engineer with his slide rule and a vest pocket full of heat units was not abroad in the land.

Anyone with a kit of tools, and strong arms with a willingness to use them could get something to do.

The earliest problems were heating.

An old method, that like some men's notes, ought to have been good—there were so many holding them—was to compute the cubical contents, look wise, guess at a factor and arrive at the amount of heating surface by the simple process of dividing the contents by the factor. That seemed simple but lots of times it didn't work.

The more potent elements, of amount of exposed wall and glass surface, thickness of walls, wind velocities, average winter climate, type and constructions of roof and a lot of other things have, it has been found out, a greater bearing on the answer.

In fact scientific heating is really a complicated problem—one of the most complicated we have.

For—after it has been decided how many million heat units will be required to do a certain amount of work there remains to be decided how and where they will come from.

Piping—very simple matter—nothing but piping.

Shall we use direct steam or exhaust—or shall we use a forced circulation of hot water. These are some of the things the piping business has resolved itself into.

Plain out and out engineering.

In other words we have another specialty—each individual customer, and his problem, solved on the basis of—how would we do this if it were our own money we were spending.

Now ventilating, that's an allied mill problem. Owners of mills and factories are beginning to look into the matter of fresh air. We believe they should. It's a cheap commodity.

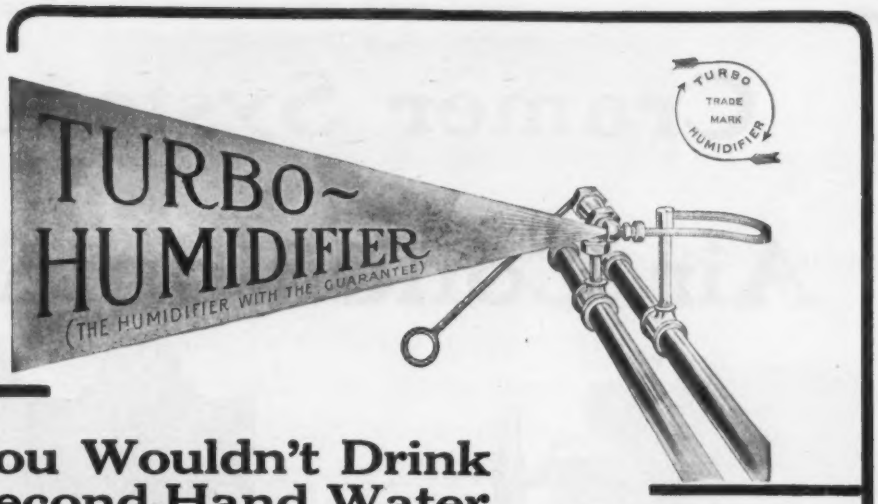
The State of Massachusetts requires 30 cubic feet of fresh air for each occupant each minute in its schoolhouses and public halls.

If you work your ventilating problem out on this basis—taking in mind the number of people you have to supply—you will find we think that ventilation is more of a local problem.

If your problem couples with it heating and humidifying—or either one of the two, we have a few suggestions we would like to offer at the proper time and place.

PARKO

The G. M. Parks Company, Fitchburg, Massachusetts



You Wouldn't Drink Second-Hand Water Why Breathe It?

Obviously it would not be considered sanitary to drink second-hand water. For the same reasons you should not breathe, nor force others to breathe, second-hand water in your mill.

The Turbo System of humidification is the one that gives you pure water to breathe, and for *humanitarian* as well as *dividend* motives it is the system that should be used.

The Pure Water Humidifier with a Guarantee

completely vaporizes the water it uses, prevents accumulation of dust and lint, maintains humidity at any desired degree and is most flexible and adaptable.

As you saw at the Textile Exhibition it is a simple and economical system of humidification for textile mills, free from the undesirable parts of humidifying equipment, such as motors, fans, straining cloths, and moving parts, that are likely to break down and cause trouble.

That is why the up-keep cost of the Turbo is a negligible quantity and the saving in the *decreased* number of "seconds" and the *increased* number of "firsts" due to the right kind (that is the Turbo quality) of humidification, more than offsets the entire cost of the equipment.

There is a Turbo man ready to prove to you that the Turbo can make money for you.

Shall we send him?.....

Or would you like to see the Turbo catalogue first?.....

Just answer in the blank spaces—pin the ad to your letter-head and sign individual name of man to be addressed. The rest will be done without obligating you.

The G. M. Parks Company

Fitchburg, Mass.

Southern Office, 200 Commercial Bank Building. J. S. Cothran, Mgr.

Cramer System
of
Air Conditioning

Cramer "High Duty" Air Conditioner

Cramer Automatic Regulator

FACTS

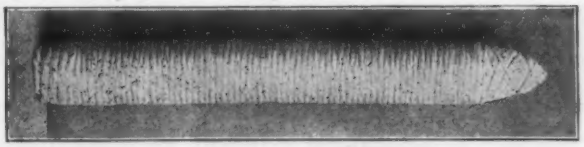
In several large mills equipped with humidifiers of other makes, we have entirely reorganized their system, installing our "High Duty" equipment with automatic humidity and temperature control and the average improvement during the succeeding twelve months test is:

A—Seconds reduced over 50%.
B—Production uniform day after day (No big jumps.)
C—Actual waste account halved.
D—Large saving in "invisible waste."

What Would Similar Results Be Worth To You?

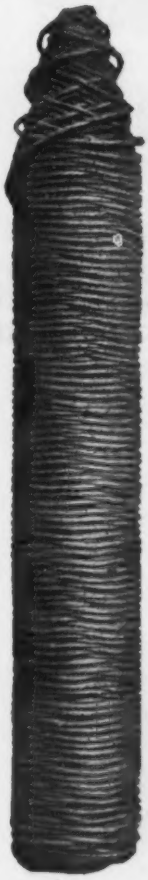
STUART W. CRAMER

50 Church St. New York — **Charlotte, N. C.** — Tremont Bldg. Boston, Mass.

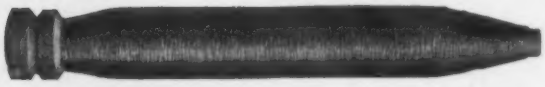


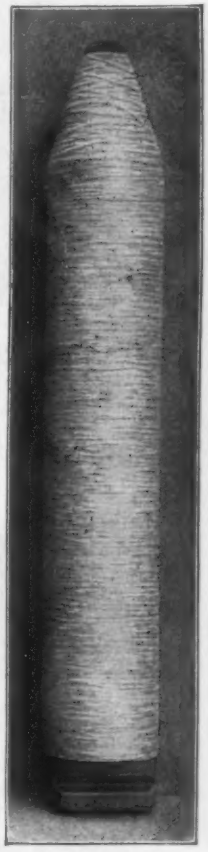
No. 2

No. 1 and No. 2—Cops to weave from inside seven-eighths to three inches diameter and up to seventeen inches long. Suitable for various kinds of coarse goods such as grass matting, cotton bagging, cocoa matting, all kinds of carpets, felts, chinchilla, linen, jute, flax, asbestos, hose and narrow fabrics such as wicks, belting, webbing, surcingles, halters, etc.



No. 3 and No. 4 Shuttle Bobbins from seven-eighths to two inches in diameter and any length up to twelve inches. Suitable for all kinds of duck, upholsteries, tapestries, asbestos, ratana or any kind of fancy yarns for automatic or other looms.





No. 1 No. 4 No. 3

OSWALD LEVER CO., Inc.

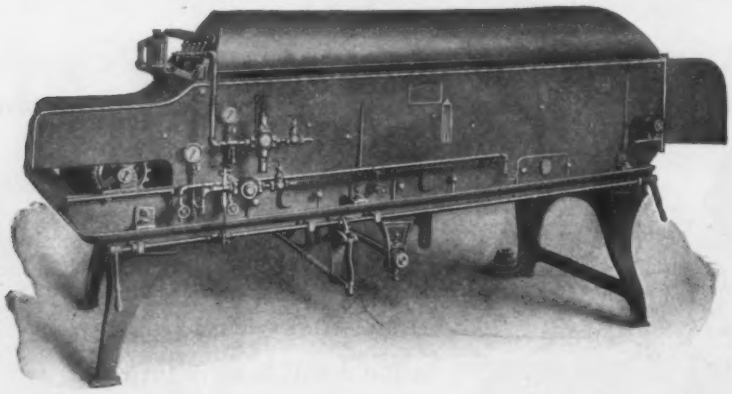
Lehigh Avenue and Front Street, Philadelphia, Pa.

Builders of Textile Machinery

WINDERS ESPECIALLY

The Yarn Conditioning Machine

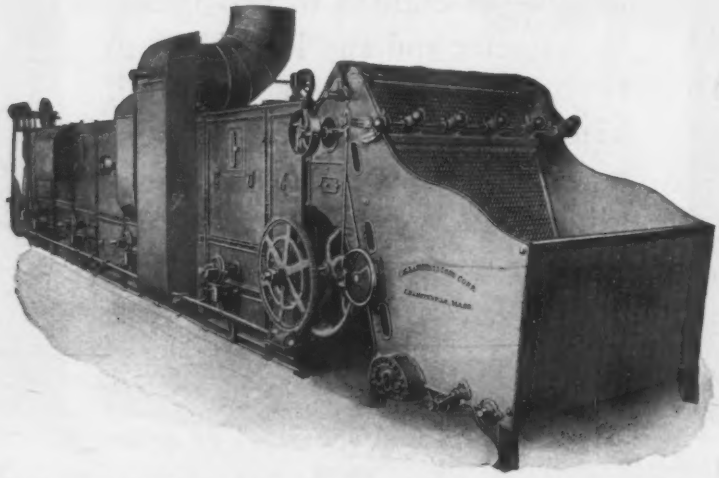
Sets the twist in your filling and overcomes kinky filling difficulties. It conditions without injuring the bobbins



The Sargent Drying Machines

Metal Construction
Asbestos Insulation

Scientifically designed for greatest economy in drying Cotton, Wool, Hair.

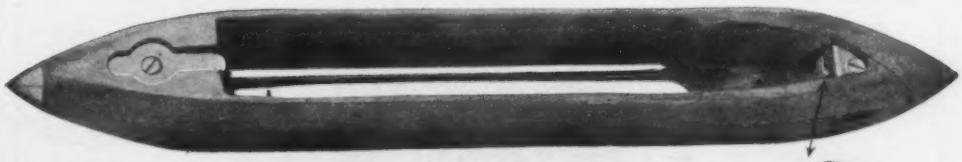


Wool Washers, Wool Dusters and Openers, Burr Pickers
Complete Carbonizing Plants
Automatic Feeds for Cotton and Wool

C. G. Sargent's Sons Corp., Graniteville, Mass.

New Hand-Threading Shuttle

The Caron Patent Hand Threader



This "THROAT PLATE" (slightly enlarged) is so designed that the Yarn *cannot "Balloon"*

This "SIDE EYE" (slightly enlarged), made in two parts, *prevents unthreading.*

The Simplest and Most Quickly Threaded Shuttle Made

It can be filled with the finest silk or the coarsest filling—will neither *unthread* nor "*balloon*"—lint that accumulates is easily removed—felt can be inserted for tension purposes—and being a hand-threading shuttle, it is sanitary.

This shuttle is entirely different from all others. It has been severely tested for a year by large mills and is the most effective hand threader on the market.

Trial orders solicited—Satisfaction guaranteed

Paper Cop Tubes Cones and Shells

Send your samples and we will quote prices on any lot desired

Shuttles and Shuttle Irons

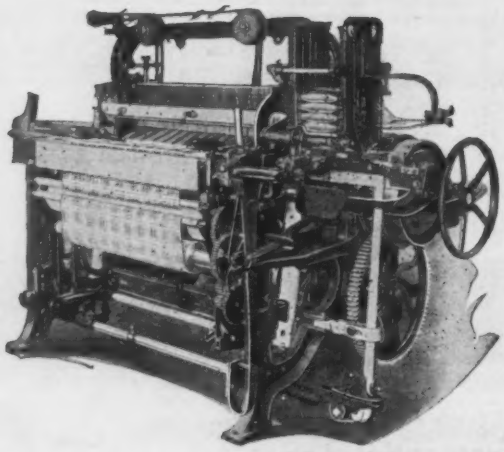
For All Textile Purposes

American Textile Specialty Machinery Co.

670 Eddy Street - Providence, R. I.

13th St. and Boulevard, Long Island City

Crompton & Knowles Loom Works



Automatic Gingham Looms

One of our latest productions for weaving goods of two or more colors in the filling. Like every loom we build, it has the advantage of a successful mill test.

WORCESTER, MASS.

Providence, R. I. **Philadelphia, Pa.**

Southern representative, ALEXANDER & GARSED, Charlotte, N. C.

ECONOMY AND SAFETY

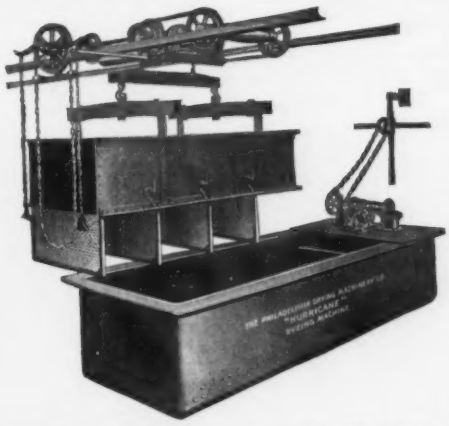
YOU GET BOTH WITH

"Hurricane" Machinery

FOR

HOSIERY
SKEIN
YARN
SLUBBING
etc.

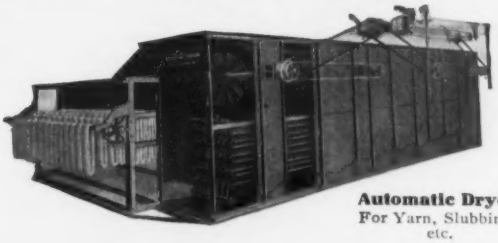
The best and mosteconomical Dyeing Machines



BETTER DYEING at LESS EXPENSE

Give us an opportunity to prove our claims

"Hurricane" Circulating Dyeing Machines are built in various sizes and types



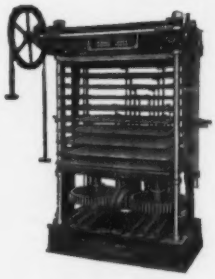
Automatic Dryer
For Yarn, Slubbing, etc.

Complete Equipments for

Dyeing
Scouring
Bleaching
Carbonizing

FIRE-PROOF DRYERS

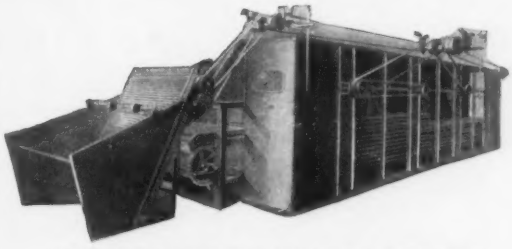
STEEL CONSTRUCTION
INSULATED WITH ASBESTOS



Power-Screw and Hydraulic
PRESSES

Fans

Motor and Belt Driven



AUTOMATIC STOCK DRYER
(With Sectional-Continuous Conveyor)
For Cotton, Wool, Hair, Rags, etc.

THE PHILADELPHIA DRYING MACHINERY CO.

Main Office and Works: 6721 Germantown Ave., Phila., Pa. **Boston Office: 53 State Street**

MR. SUPERINTENDENT

"A Word to the Wise"

When you place the safe keeping of your plant in the hands of your night watchman, do you equip him with an absolutely safe and reliable **LANTERN**? Or do you let him carry a lantern that permits easy access to the flame, one in which the globe is not properly protected; if the lantern he carries be dropped or overturned are you sure that the oil would not run out and ignite?

If you want an Absolutely Safe Lantern

we invite your attention to the

DIETZ IMPROVED "BLIZZARD" MILL LANTERN

shown in the illustration. This lantern has reinforced side tubes, solderless fount guaranteed oil tight, improved steel burner securely locked in place with one-inch wick, selected globe, and gives a light of 10 C. P. Finish, red enamel.

We suggest that you secure a sample **DIETZ NO. 2 "BLIZZARD"** Mill Lantern through your local dealer and we feel certain that after giving it a thorough trial you will equip your night watchmen with

Dietz Mill Lanterns

which are Approved by Insurance Inspection Departments

Our complete 200 page catalog showing various Lamps and Lanterns for mill and other uses will be sent free upon request.

DIETZ "BLIZZARD" MILL LANTERN

R. E. DIETZ COMPANY

Largest Makers of Lanterns in the World

Founded 1840 **New York City**

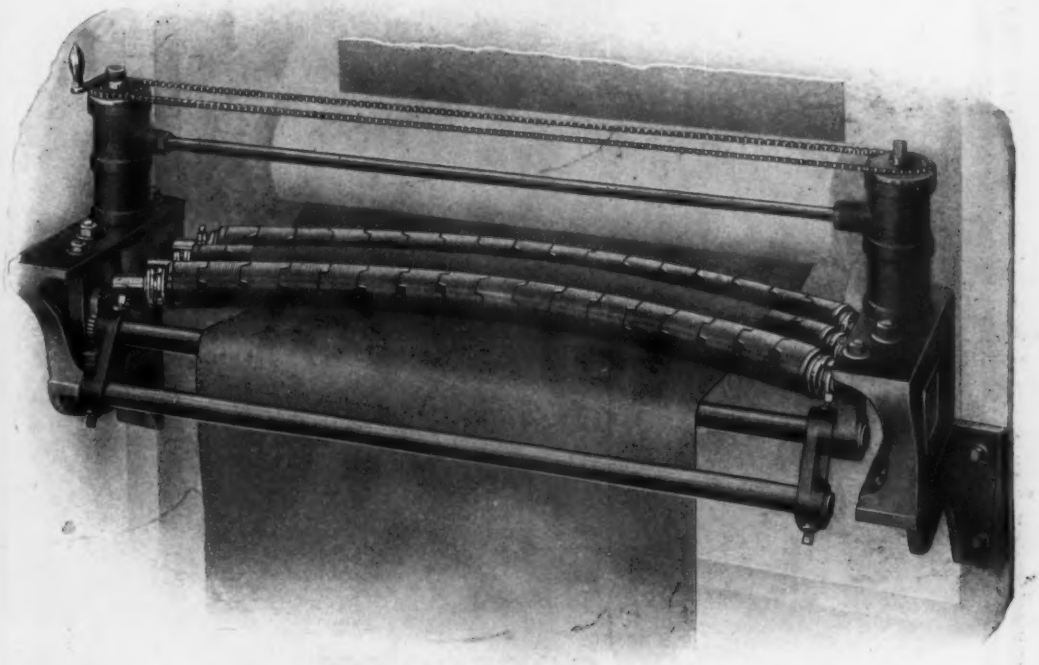
THOMAS LEYLAND & COMPANY

F. T. Walsh, Manager

60 India Street, Boston, Mass. WORKS AT READVILLE, MASS.

Sole Manufacturers of THE WILLIAM MYCOCK

Improved Regulating Cloth Expander

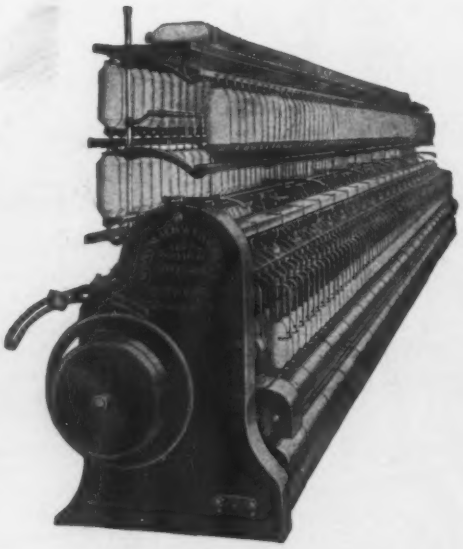


Expander attached to Calendar showing Regulating Motion and Adjustable Tension Bars

This Expander and its improved features are fully protected by basic United States patents, under which the builders will maintain their patent rights against any who may violate such rights by building, selling or using machines of this character.

Scutchers, Sewing Machines, Open Bleaching Machines, Blanket Washers for Calico Printers, Guides, Etc.

Cotton Machinery by Specialists



With Latest Improvements

Maximum of Efficiency Minimum of Repairs

Woonsocket Machine & Press Company

Southern Representative:
J. H. MAYES, Independence Bldg.
Charlotte, N. C.

Northern Representative:
WM. V. THRELFALL, Marshall Bldg.
Boston, Mass.

Cotton Machinery by Specialists

Pickers and Revolving Flat Cards

POTTER & JOHNSTON MACHINE CO.

Pawtucket, R. I.

Drawing and Roving Machinery

WOONSOCKET MACHINE & PRESS CO.

Woonsocket, R. I.

Ring Spinning and Twisting Frames

FALES & JENKS MACHINE CO.

Pawtucket, R. I.

Spoolers, Winders and Reels

EASTON & BURNHAM MACHINE CO.

Pawtucket, R. I.

Warpers and Beamers

T. C. ENTWISTLE CO.

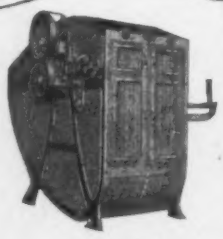
Lowell, Mass.

Southern Representative:
J. H. MAYES, Independence Bldg.
Charlotte, N. C.

Northern Representative:
WM. V. THRELFALL, Marshall Bldg.
Boston, Mass.

The Hunter

NO. 10
FULLING
MILL



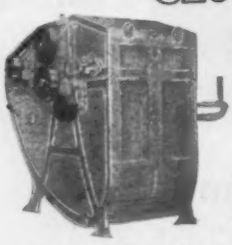
DRIVING SIDE

GEAR DRIVE

CLOTH WASHERS

PEICE DYE
KETTLES

SOAPING
MACHINES



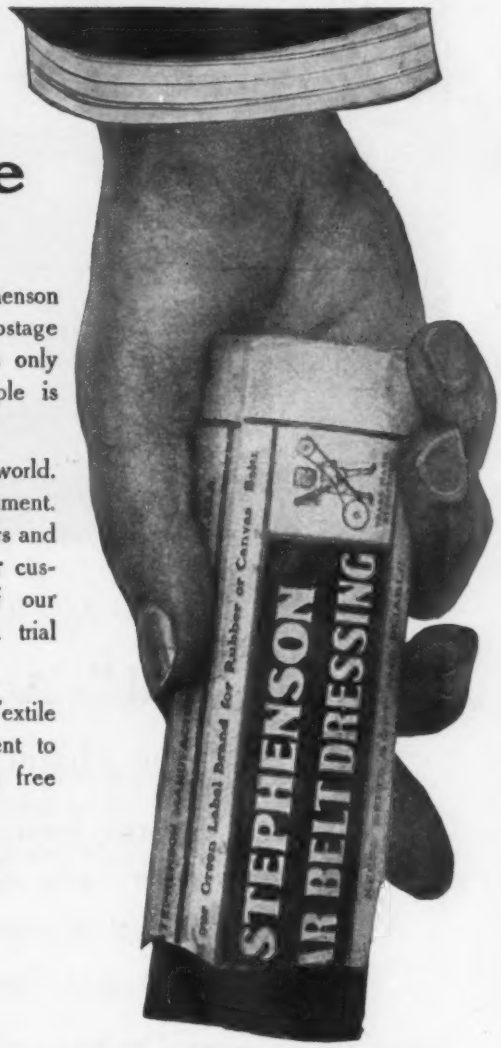
BELT DRIVE

ROPE DRIVE

JAMES HUNTER MACHINE CO.

NORTH ADAMS, MASS., U. S. A.

Yours For 2 Cents



This Sample Is Free

You can get this half-pound stick of Stephenson Bar Belt Dressing. The cost of a postage stamp, to bring your request to us, is the only cost to you—now or later. The sample is ***absolutely free.***

The most approved dressing in the world. ¶ Quality and utility our only selling argument. ¶ Used in textile mills for twenty-five years and never a stick of dressing returned. ¶ Our customers are obtained by pure merit of our product. Price higher than any. ¶ A trial costs nothing. Send for sample.

Just say, "Send me sample as offered in Textile World Record," or pin this advertisement to your letter-head and mail it now and a free sample will go to you by return mail.

Stephenson Mfg. Co.
Albany, N. Y.

Will You Take It?

Another recent installation

400 "Ideal" Automatic Looms

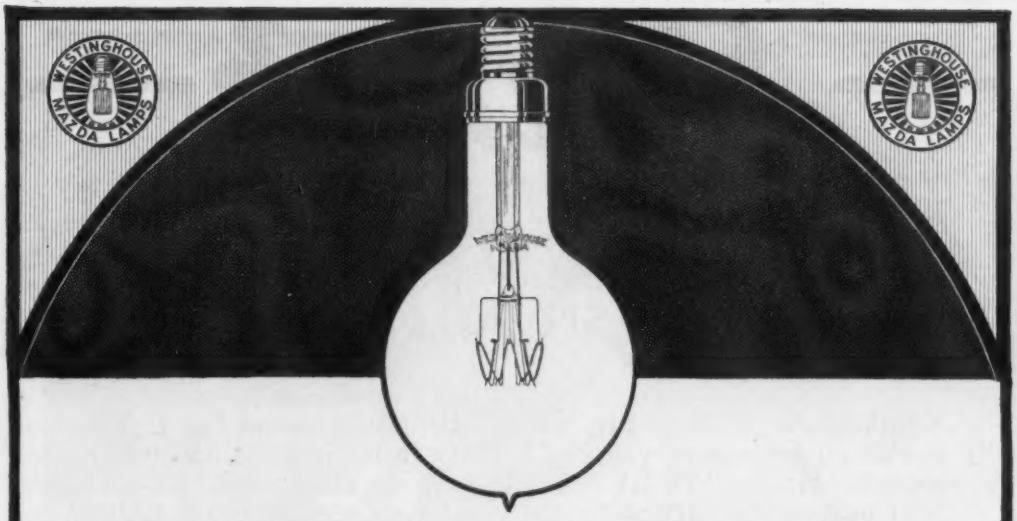
on 5 harness sateens

These looms were installed as the result of a test during which the superiority of Stafford Looms over all competitors was clearly demonstrated

THE STAFFORD COMPANY

READVILLE, MASS.

FRED H. WHITE, Southern Agent - - Charlotte, N. C.



Save More Money On Your Lighting With Big New Westinghouse Mazda Lamps

The new 750 and 1000 watt Westinghouse Mazda Lamps enable you to get the benefit of the simplicity and reliability of the incandescent system at an operating cost much below that of either system.

They require no special attention which brings the maintenance cost to a minimum.

They give you the light of the finest quality which means more and better production.

They are "Westinghouse" Lamps which insures the successful and dependable operation of your lighting system.

In other words, the new Westinghouse Mazdas help you to bring your lighting nearer 100% efficiency.

Our bulletin shows in detail what the lamps will do for you. Send for it.

"Guaranteed by the name"

Westinghouse Lamp Company

Offices throughout the country

FACTORIES
Bloomfield, N. J., New York, N. Y.

GENERAL OFFICES
1261 Broadway, New York, N. Y.

Starch

THE particular case of your own mill needs careful study to determine what starch is best suited to *your* SIZING and FINISHING problems.

We have reduced the manufacture of starches for textile work to a science by years of factory investigation and laboratory research. We are ready to take up the special case of your mill and point out to you what starches are most adaptable and reliable for your purposes.

Six years of careful investigation of conditions in the cotton mills of the country has taught us the needs of the trade.

Six years' research in the best equipped Starch Laboratory in America has put us in touch with starch chemistry.

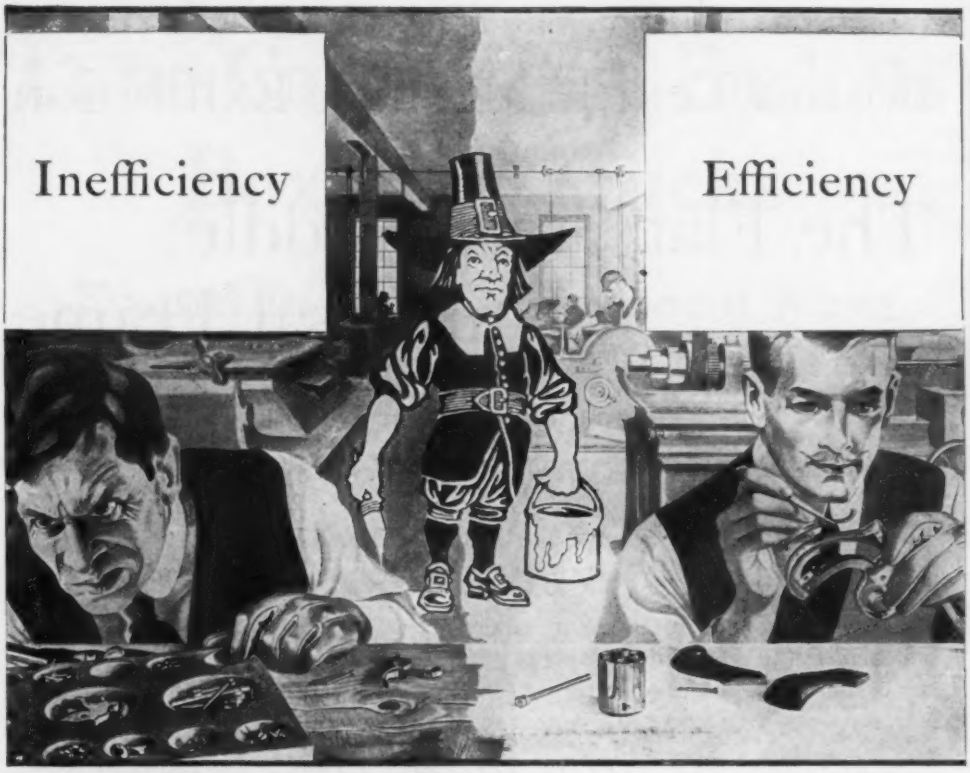
Six years of manufacturing, with cotton mill problems in mind, has produced our special Brands of Textile Starches.

We want to send our special starch expert to your mill. We want him to go into the matter of sizing with your boss of slashing—check up your sizing processes—find out whether you are now using the starches that will insure you the most efficient and economical results.

This special starch expert service is absolutely free—send us a sample of the starches you are using. We will give you an exact analysis of them and send our practical man to study your needs. Write a letter now to our Mill Starch Department.

Corn Products Refining Company
NEW YORK

Starch



Turn the Light of Profit on Your Factory Lighten the Day Work and Reduce Costly Depreciation

BAY STATE

BRICK AND CEMENT COATING

Is made for the specific purpose of giving workable light to dark corners, which shows a great saving in the consumption of artificial light and where conditions are satisfactory, surfaces coated are rendered free from chipping or peeling, thus protecting intricate machinery from injury and resisting the action of steam, acids and gases, producing results which all tend to increase the efficiency of employees.

Send for our Interesting Booklet 12, which contains complete information on the subject of Painting

WADSWORTH, HOWLAND & CO., INC.

Paint and Varnish Makers and Lead Corroders

BOSTON, MASS.

FREE BOOKLET COUPON

Tear out and fill in carefully.

Wadsworth, Howland & Co., Inc. Boston.

Please send without any obligation on my part free booklet on the subject of cement coatings.

Name.....

Street.....

City.....State.....

EVERY VISITOR TO THE

Boston Textile Machine Exhibition

WILL AGREE THAT

The Flat Steel Heddle AND Universal Frame

Played a most prominent part in the efficient running of the looms exhibited by

The Crompton & Knowles Loom Works,
The Stafford Loom Works,
The Mason Machine Works,
The Lowell Textile School

These concerns realize the great importance of the Steel Heddle—the heddle punched from flat cast steel—with the round cornerless eye that cannot catch or rub or chafe or pull the warp thread—the heddle that adjusts itself automatically on the frame—the heddle that cannot twist or bend while at work.

COTTON, SILK, WORSTED or WOOL
THERE IS A HEDDLE FOR THE WORK

From fancy cotton shirtings to canvas—from narrow fabrics to broad silks—from light worsteds to heavy cloths there is a particular heddle for your particular kind of work.

These heddles are not experiments. They are FACTS. Their efficiency has been proven so often that the novelty is lost. Do you want a list of users in your particular line? Write to these people yourself. They'll tell you what Steel Heddle Equipment has done for them.

SEEING IS BELIEVING

Steel Heddle Manufacturing Co.

2100-18 W. Allegheny Ave., Philadelphia, Pa.

Providence Office - - - - 76 Dorrance St., Providence, R. I.

Lane Canvas Mill Baskets Boxes or Trucks

Found in the Largest and Most Modern Mills

BECAUSE

Durability
Smoothness
Lightness
Economy

FIG. 27

Lane Canvas Truck.
Made as shown, or with canvas partition. Mounted on improved **Thread Guard** Wheels, as above, or on swivel casters. Leather bound rim. Heavy duck.

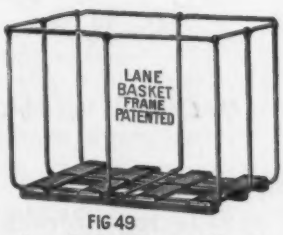


FIG 49

Lane Basket Frame of Tough Spring Steel.
Renewable Hard Maple Shoes. Also furnished with steel shoes, where dragging is not severe.
Number and diameter of frames varies with size of baskets.

COUNT

A Style for Every Use

W. T. Lane & Brother

Manufacturers

Poughkeepsie **New York**

"BRETON"

OILS FOR WOOL

Adapted for All Kinds of Wool Batching

In Daily Use by Leading Mills for Over 25 Years

They are as carefully and accurately prepared to meet textile requirements as long experience and expert chemical knowledge can devise. Only the best of materials are used and every gallon is made in our own factory

Paragon and Union Apron Oils

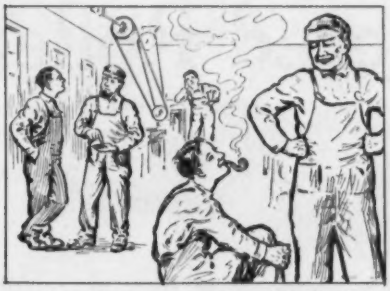
INCREASE PRODUCTION IN KNITTING MILLS

BORNE, SCRYMSER COMPANY

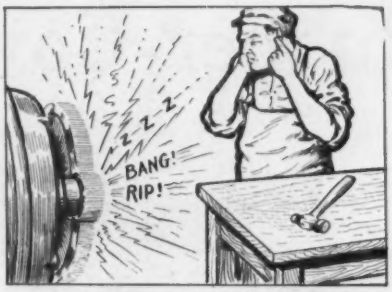
80 South Street, NEW YORK

BOSTON **PHILADELPHIA**

Meet us at Spaces 75-76 4th National Textile Exhibition



Would you permit this during working hours? Not much; for bad discipline never promotes good production.



Then why tolerate gear noises which are just as easy to prevent and which impair both production and machines and waste power?

Join the anti-noise crusade!

You can quiet your gears on exceedingly profitable terms

New York City has a public service commission expressly to subdue needless nerve-racking noises—and every city demands the quiet that is essential to comfort and useful activity.

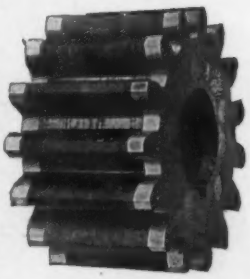
In the mill, shop or factory, screeching grinding metal-to-metal gear contacts not only stunt the capacity and health of operatives, but invariably indicate power loss, destructive vibration of machine parts and sometimes an impaired product.

NEW PROCESS NOISELESS PINIONS

bring permanent relief from the torturing brain-piercing riot of metal-to-metal gear noises.

Their use permits men to think properly and act quicker. Mutual good will is stimulated and mechanical conditions are bettered. The larger intermeshing gear is better protected from stripping of teeth, and the cushioning of vibration better protects delicate machine surface and adjustments. Such improved conditions, together with the power saving, make New Process Pinion installations pay for themselves quickly and constitute a correct step toward scientific management.

Our book "Noiseless Gear Driving" explains in detail. Send for and read your copy.



NEW PROCESS IS TO ALL OTHER RAWHIDE AS STEEL IS TO IRON

N.P.R.H. NEW PROCESS GEAR CORPORATION N.P.R.H.

SYRACUSE, N.Y.

Canadian Agents: Robert Gardner & Son, Ltd., Montreal

88

Rubber-Covered Rollers

For all Textile Uses

New Rollers Complete **Old Rollers Re-covered**

Our rubber coverings are made with the greatest care, from strictly high grade, carefully selected gums. They cost a little more than some other coverings. Rollers covered by us produce results that are unequaled and render service in full proportion to their cost. Their use reduces your cost of production. The long-continued patronage of many of the largest and most successful textile mills is a significant endorsement of the excellence of our rubber-covered rollers

Gutta-Balata Belting

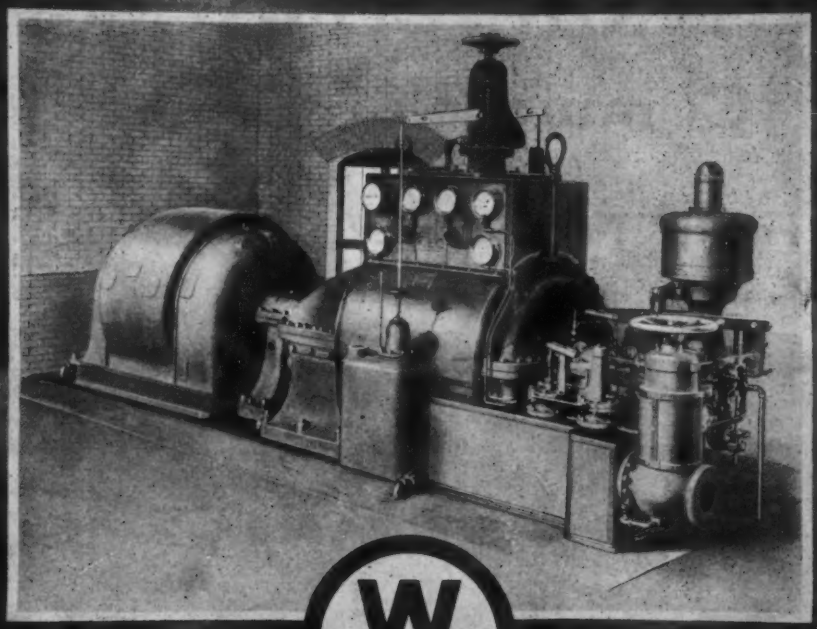
Strong — Pliable — Waterproof

Made on extra heavy, close-woven duck. Has absolutely seamless faces; and either side can be run next the pulleys. Has minimum amount of stretch, does not slip easily, and transmits the maximum of power. Cost considerable less than leather belting.

Have you ever investigated the merits of "Roxbro" Braided Rubber Hose for use with compressed air for cleaning machinery?

BOSTON BELTING COMPANY

Boston New York Buffalo Chicago Philadelphia Baltimore Atlanta



W
WESTINGHOUSE ELECTRIC

More Than 150,000 H. P. of Westinghouse Turbines are driving textile mills

The textile manufacturer who specifies Westinghouse Turbines is assured of getting successful and efficient service from his power plant, because of the Westinghouse Company's long and extensive experience in this field.

All types—high pressure, low pressure and bleeder turbines—can be supplied. We will gladly assist you in selecting the proper type to suit your special needs.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

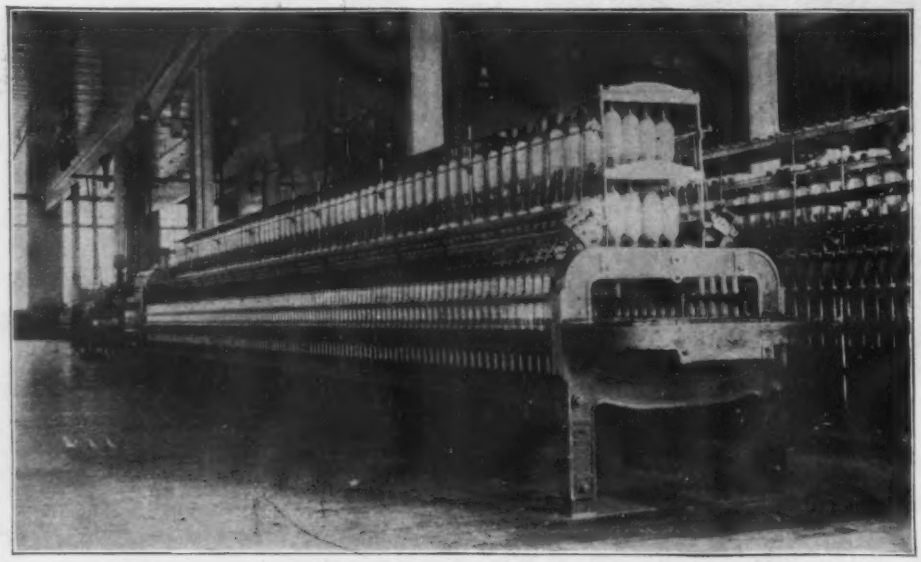
THE BROWN SPIN-WRIGHT

Commercial Frame

As Exhibited at

Fourth National Textile Exhibition

April 27th—May 2nd, Boston

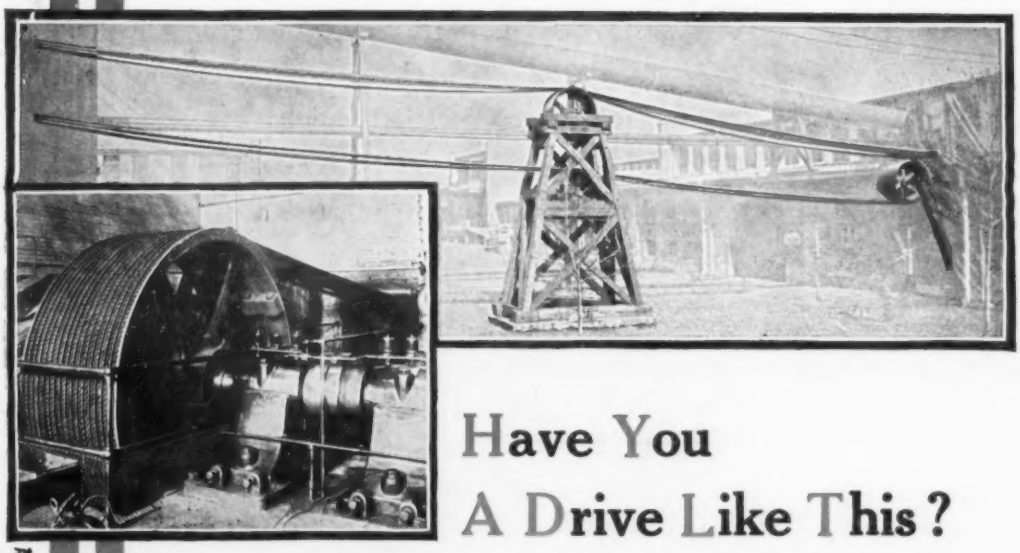


For Particulars Address

The Brown Spin-Wright Cotton Co.

32 Union Square, New York, N. Y.

1502 Purchase Street, New Bedford, Mass.



Have You A Drive Like This?

¶ Have you a rope drive which starts in the engine room, goes through the wall and carries power through the open air to a factory half a block away?

¶ Such an out-door drive causes no operating difficulties it you use

AMERICAN
TRANSMISSION ROPE

¶ The Transmission Rope made with internal, self-distributing lubricant, which working to the sur face everywhere, protects and preserves it in the extremes of heat or cold—through rain or snow. No external dressing need be applied—no care required—expense and trouble done away with.

¶ This lubricant acts as a preventive of internal fibre friction—the rubbing of yarn upon yarn that wears away any rope not so protected. Besides this, AMERICAN TRANSMISSION ROPE'S superiority is due to the quality of pure Manila used—only Manila throughout—and the constant testing and inspection it undergoes and the trustworthy methods of experienced rope-makers.

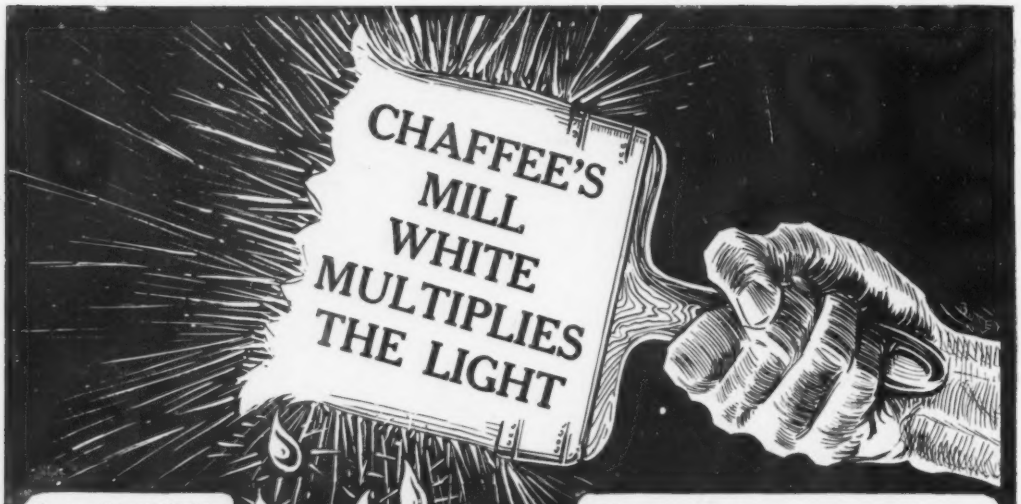
WRITE FOR THIS FREE BOOK

We will be glad to send you our "Blue Book of Rope Transmission" upon request on business letterhead. It contains a great deal of useful information about rope driving and helpful suggestions respecting the care of rope, splicing, etc. Send in your name today.

We Ship Without delay—on Telegram if Necessary—
from either point of manufacture

American Manufacturing Co.
Dept. T
Brooklyn, N. Y. City

St. Louis Cordage Mills
Dept. T
St. Louis, Missouri

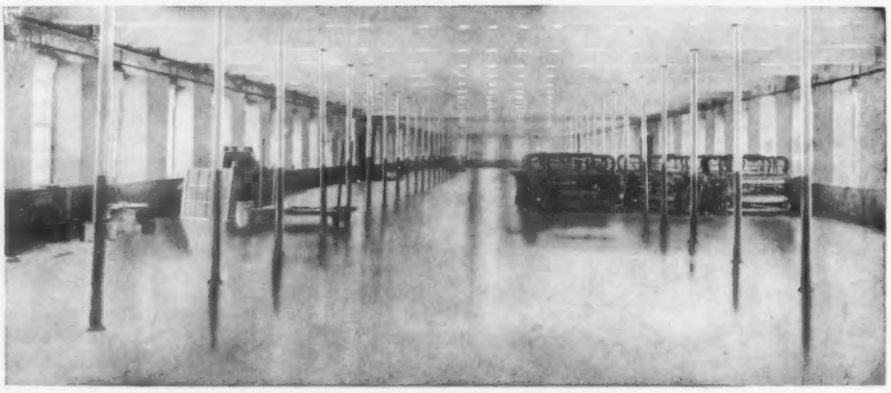


See how this Old Mill has been made like New with

Chaffee's Mill White

This was a thick walled, narrow windowed mill, dark and dingy, and requiring too much artificial light.

Then it was treated with Chaffee's Mill White. Now it has no dark corners—the walls and ceilings fairly sparkle. Any mill with average window area can approximate the ideal natural lighting of "window walled" plants by a Chaffee "treatment." It produces a flintlike surface of intense white that reflects and diffuses the light—prevents accidents, aids workmen, "stretches day light" and reduces lighting bills.



THE OLD DINGY MILL MADE BRIGHT BY CHAFFEE'S MILL WHITE

Do You want More Light at Less Cost?

You can have it by having your old (or new) ceilings and walls coated with "The Paint With a Purpose." Its intense body, easy working qualities and far reaching capacity decrease cost of application (2/3 total cost) and offset the difference in its cost as compared to that of inferior preparations. This permanent and impenetrable coat of pure white will neither flake nor crack. It sheds dirt, is easily washed and will not turn yellow with age as do lead and oil paints. Send for sample panel and note the "difference." Test its elastic qualities that prevent cracking even on ceilings that warp, vibrate and sag. Test its light reflecting qualities that make for "better working conditions,"

Giving 25 to 33% More Light.

Write Department Y, and ask for descriptive booklet and paint panel ***today***—not tomorrow—you might forget it.

THOMAS K. CHAFFEE CO., (Dept. Y) PROVIDENCE, R. I.

THOUSANDS

of

HESS-BRIGHT

are used on

Textile Machinery

They are oil-tight—oil won't drip on your textiles—drip pans are not needed. Hess-Bright Ball Bearings mean no hot boxes, no needless fire risk; less expense for oil, fuel, belting and labor.

Write us now if interested

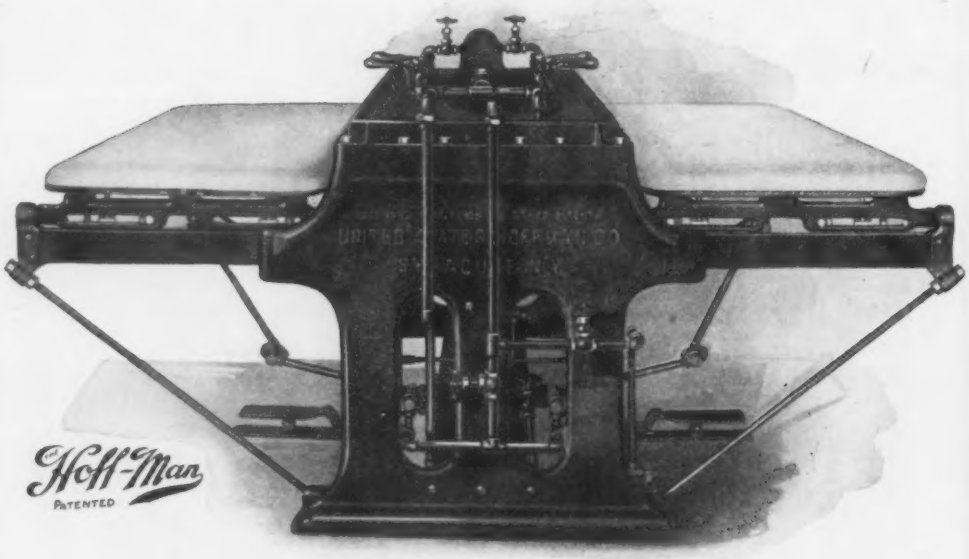
The Hess-Bright Mfg. Company

Philadelphia, Pa.

NEW YORK, 1974 Broadway CHICAGO, 1800 Michigan Ave.
PHILADELPHIA, 666 North Broad Street

SHOWN-AT-THE HOSIERY AND UNDERWEAR CONVENTION-PHILADELPHIA

ITS-POPULARITY-AND-EFFICIENCY
WERE-DEMONSTRATED-BY-THE
INTEREST-IT-CREATED-THERE



"Hoff-man" "FFF" Underwear Press

DIRECT-APPLICATION-of-LIVE-DRY-STEAM
CAN-BE-INSTALLED-ANYWHERE-IN
THE-MILL. AN-INDEPENDENT-UNIT

United States Hoffman Co.
Syracuse, N.Y.

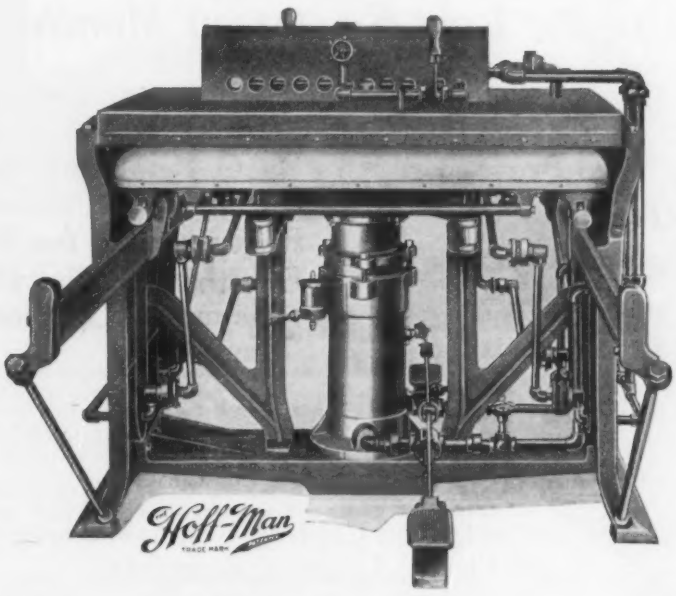
This Is Our New

HOSIERY PRESS

SHOWN AT THE

Hosiery and Underwear Exhibition

In Philadelphia



HOFFMAN L HOSIERY PRESS

Can be installed anywhere in the mill. An independent unit. The direct application of hot, dry steam produces a beautiful lustre.

United States Hoffman Co.

SYRACUSE, New York

The Greatest Improvement Made in Cotton Spinning in Quarter of a Century

The Richards-Hinds Light Running Roll

Orders for over 100,000 Spindles Received in the Last Seventeen Months

GUARANTEED CLAIMS

Cockley Yarn Preventor
Extra Strength
Better Spinning
Less Waste
Less Change of Settings
Greater Production with Improved Product
Reduced Cost for Spinning
One-third of the First Cost Saved in Leather Covering

We also build our line of

METALLIC ROLLS

Especially adapted to Cotton Carding Room Machinery and applied to the following machines

Sliver Laps **Ribbon Laps** **Comber Draw Boxes**
Detaching Rolls **Railway Heads** **Drawing Frames**
Slubbers and Intermediate Roving

25 to 33 per cent More Product Guaranteed
Weights Reduced from 33 to 50 per cent

All Machine Builders are Agents and Will Quote Prices for New Work.
For Particulars Write To

THE METALLIC DRAWING ROLL CO.

INDIAN ORCHARD, MASS.

The New Kron Baby

THE KRON COUNTER SCALE

"She's a Beauty"

Tells at a Glance---Correct Weight---Instantly

Built upon the same simple principle as other well-known types of the Kron, there being

No Springs---No Pivots---No Knife-Edges, in Dial Mechanism
No Vibration---pointer stops "dead" at accurate weight

Designed for use in factory, mill, shop or store, railway and express offices; in fact, for any business where quick and accurate weighing of small quantities of material, packages, etc., is required.

A Big, Clear Reading Dial Readable on Both Sides

Full Capacity Shown on Dial

Weighs as fast as you can load and unload the scale

Capacities 75 lbs. to 200 lbs. Platform 13¼ x 19 inches

Prices and further information furnished upon request

Automatic — Kron Scales — Springless

"Load and Look"

Represent the highest type of absolutely automatic weighing and are the most durable scales ever built, being entirely of metal and only the best materials, combined with expert workmanship, are used in their construction, with the result that they successfully withstand the roughest usage in the hardest service.

There is a type of Kron, either Dormant or Portable, to meet every requirement of any business where speed and accuracy are essential to highest efficiency in weighing.

Leading Textile Mills and leading industrial plants of every description, Packing and Provision Houses, Railway and Express Companies—every business where a saving of time and labor, the elimination of errors and guesswork mean a saving of money, are using the Kron.

By reason of its speed and accuracy it is saving many thousands of dollars yearly to the users.

Send for our Catalogue. See how to reduce weighing costs and to increase efficiency in your business. Write to-day.

TARE BEAM
for automatic deduction of tare, so that only the net weight is shown on the dial.

American Kron Scale Co.,

39 Cortlandt Street,
New York

1029-1031 South Wabash Ave., Chicago, Ill.

PORTABLE CONDITIONING ROOM

THE STANDARD SYSTEM

Automatic in action, producing any desired "CONDITION" or "REGAIN"

OUR METHOD

Produces Accurate and Uniform Results

Fitted for Skein Yarn, Cop or Bobbin Filling and Cones.

Capacity may be increased at any time by adding one or more sections.

Made in smaller units if desired.

Constructed to go between bays in ordinary mill construction.

We also build equipments for rooms already constructed, or of special design.

We make a SPECIALTY of "Test Room" equipments where determined and uniform conditions are necessary.

CORRESPONDENCE SOLICITED

STATE SPECIFICATIONS OF ROOM DESIRED AND NECESSARY REQUIREMENTS

American Moistening Company

BOSTON, - - MASS.

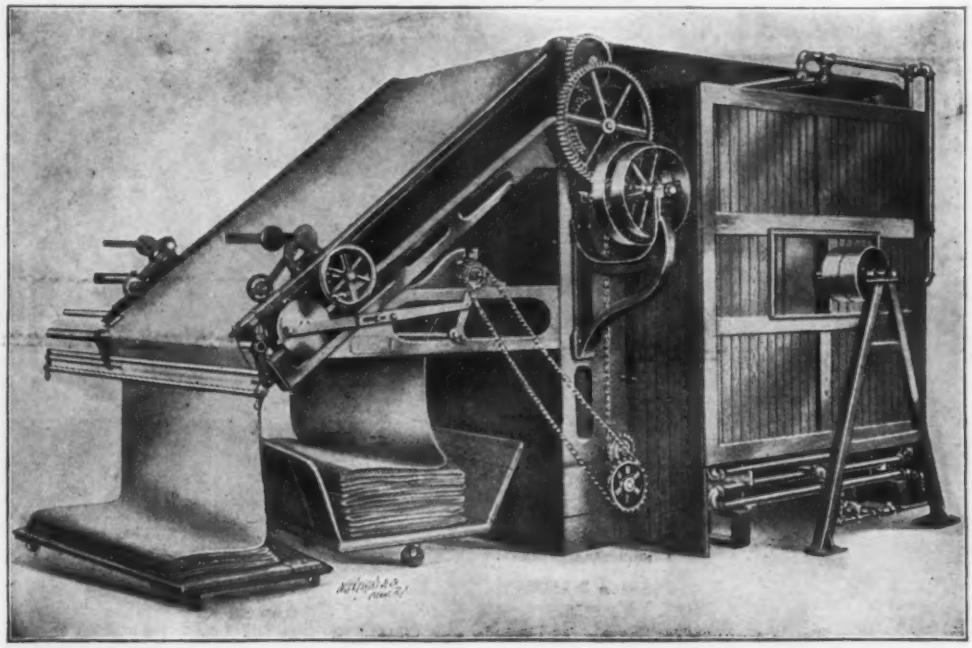
WILLIAM FIRTH, Prest. **FRANK B. COMINS, Vice-Prest. and Treas.**

The HEATHCOTE

20th Century Tentering and Drying Machine

(PATENTED)

It combines strength unlimited, a greater efficency in drying capacity than ever before known, the easiest mode of operation conceivable, the most perfect handling of the cloth, and requires no preparation for installing it whatever.



This machine is designed especially for mills with a capacity of 1,500 yards per day, more or less, according to weight of goods, and as an auxiliary machine for larger mills.

There are only one-third the number of running parts that are in the smaller size of other patterns, which means one-third cost of maintenance.

No heat can escape from the machine without passing through the cloth. The inner surface of the cloth is subjected to a blast of hot-air moving at the rate of 30,000 cu. ft. per minute through an area of 13 sq. ft. The heating coils and fan are invisible when the machine is in operation. The cloth being dried is in sight of the operator during its entire travel. Machine is adjustable to varying widths, and the wings where cloth is fed in are independently adjustable to provide for any stretch desired.

The machine is but 9 ft. high, and requires a floor space of but seven by fifteen feet for six quarters. We have a great many in use, and they are giving the greatest satisfaction. Best of references given. Its cost places it within the means of the smallest mills which have hitherto used nothing but tenter bars.

We make a specialty of all sizes of FANS for ventilating rooms, etc.

John Heathcote & Son, Builders, Providence, R. I.

Root Counters Keeping Track

Of Output and Costs in Textile Mills

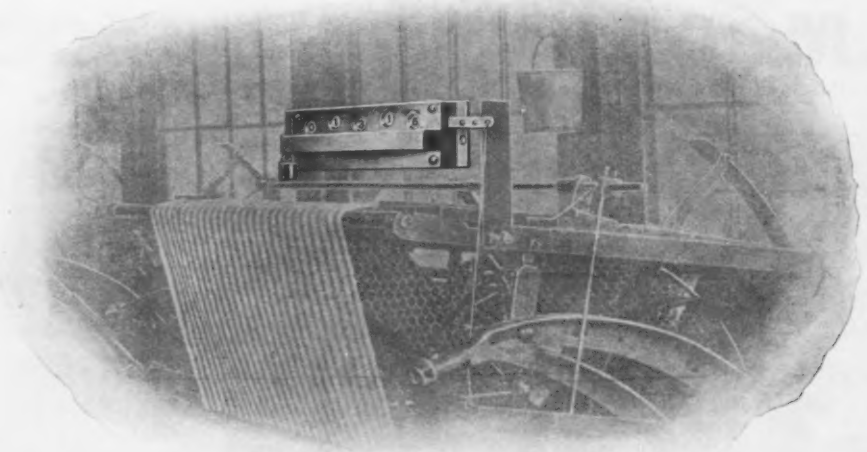
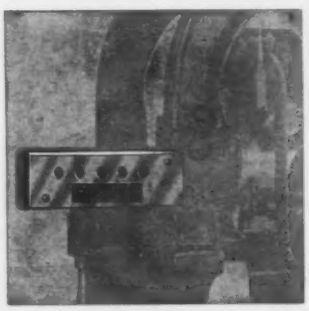


Illustration of Elm City counters attached to cloth folders made by Elliot & Hall, Worcester, Mass. Counters are connected so as not to register when there is no cloth going thru the machine.



COUNTING "PICKS"

Mechanical counters are extensively used for their convenience and reliability in this work.

In Paying Weavers

you will find that payment by the "pick" is the most satisfactory way for both you and the weaver.

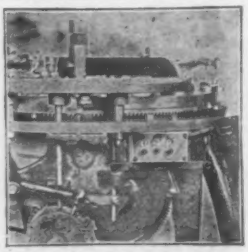
Count the "picks" with Roco Counters —they are accurate.

Illustration of our counter attached to N. E. Butt Co.'s 32

Carrier Braider

This measures the length in yards of insulated wire braided. We make counters for attaching to many other textile machines.

Try Them On Yours



The illustration shows our No. 12 Elm City counter attached to the

Leighton Sweater Knitting Machine

for counting the number of finished sweaters produced. The counter is very easily attached to this machine which is made by the Leighton Machine Co., Manchester, N. H., and is a great convenience for keeping track of production.

Root Counters Will Locate

Deficient Employees or Machines

They can be adapted to the counting of output in all departments of

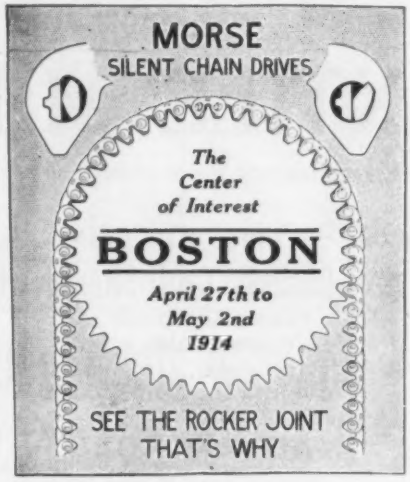
Textile Mills or Factories and are always Accurate and Reliable

They Save Waste, Prevent Errors and Disputes

We have a variety of Counters for textile mill uses

Just Ask for Catalogue No. 18 —To-day

THE C. J. ROOT COMPANY, 100 Morey St., Bristol, Conn.



"Change to Chains"

YOU came (to Boston), you saw (the sign), you're surely now convinced how much power you are losing through poor transmission, how much greater production can be secured through

Morse Silent Chain Drives

It pays to "change to chains," substituting MORSE Silent Chains for power-losing belting and noisy gearing.

It pays in the greater efficiency of the chain (power saving); in the smooth, quiet action at high or low speeds; in protection to electric motors from shocks and jars on the machines; in less floor space required, and less maintenance and attendance.

It will pay you right from the start to "change to chains" but, remember, it is better and more economical to make MORSE Chains the original drive wherever possible. Get in touch with our Textile men for complete information, also writing us for free copy of Publication No. 12.

Morse Chain Company, Ithaca, N. Y.

BOSTON: 141 Milk Street NEW YORK: 50 Church Street B 20

Some Firth Specialties

FOR

TEXTILE MILLS

Designed to reduce costs and improve the working conditions in the textile industry.

THE FIRTH Broomless Floor Sweeper

NO. 1 AND NO. 2 FOR COTTON, WORSTED AND SILK MILLS

ADVANTAGES

The Firth Broomless Sweepers for sweeping under machinery eliminate brooms. No power required—time saved—labor saved—cost of brooms saved—no young undesirable help—cleaner floors—cleaner machinery—cleaner waste—cleaner atmosphere.

One set of this Apparatus does the work of many hands, saving at least one-half of time and labor.

The Broomless Floor Sweepers go in pairs

No. 1 gently forces lint and waste from under the machinery into the opposite alley.

No 2 picks up lint and waste free from the usual matting and broom straws, leaving it easier to sort.

THE FIRTH Dustless Card Stripper

THERE ARE OVER 350 CARD ROOMS NOW EQUIPPED, STRIPPING OVER 23,000 CARDS DAILY

ADVANTAGES

Cleaner work, cleaner atmosphere, cleaner silver, cleaner machinery, cleaner card clothing, less grinding, less cleaning up after stripping cards, less facing of clothing, less "felting," full cleaning capacity of the cards maintained.

Carding, drawing, combing and roving machinery operated in the same room without injury to the work usually caused by the excessive dust while stripping.

The process of stripping cards with the apparatus is about the same as with the ordinary stripping roll. It consumes a little more time, but this extra time is more than offset by the time saved in cleaning the cards after stripping, and the many advantages to the help and general conditions.

THE FIRTH Patent Can Tramway

DEMONSTRATES ITS EFFICIENCY AND VALUE

ADVANTAGES

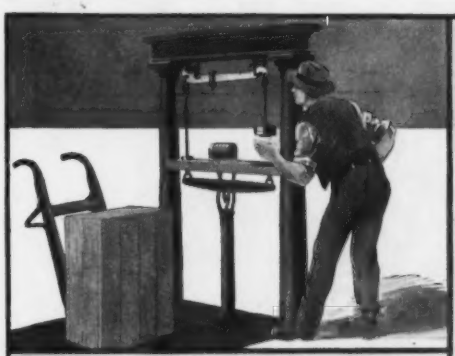
Twenty-five per cent Saving in Help in Doffing from Cards: Where formerly four "coiler boys" were required for doffing from the Cards, three can easily do the work with the CAN TRAMWAY in much less time. A smaller boy can handle the cans as there is no lifting, and more full cans can be moved at one time. Twenty or more empty cans can be easily returned from the Drawing-frames *in one trip*.

It also saves twenty-five per cent in drawing frame hands; ninety per cent in waste; eliminates the use of trucks, thus saving time and labor.

Write for descriptive leaflets, prices, etc.

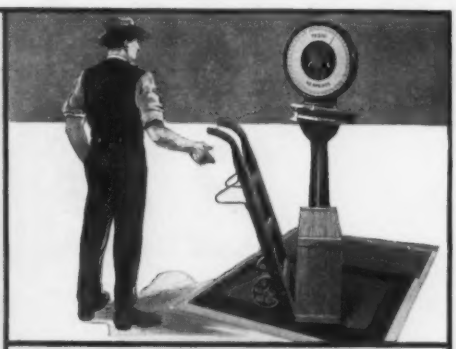
WILLIAM FIRTH

200 Devonshire Street BOSTON, MASS.



Slow-Liable To Error-Costly

TIME AND LABOR SAVING



Speed-Accuracy-Economy

Cut Weighing Costs with the Toledo Scale

Compare These Two Methods:

The man operating an old-fashioned, beam scale with the **Toledo** plan of weighing. See in the left photo how speed and accuracy are sacrificed—how the weighmaster has to fumble with weights—tap the counterpoise back and forth, wait for the beam to balance, and in the end, get only an approximated result. Notice the difference in the **Toledo** method—standing *clear* of the scale the weigher, by a mere sight transaction, gets the *exact weight instantly*, without the time-consuming mental calculations, useless motions and hand operations, necessary with other methods. *Now* you can see why the **Toledo** is *guaranteed* to cut weighing costs from *10% to 50%*.

The Saving is Proved:

And these savings are not mere possibilities, but realities—*facts daily proven by each of the 125,000* **Toledo** *Scales now in use, under every conceivable condition and in all businesses.* They are used by packers—textile mills—automobile manufacturers — wholesale grocers — paper mills—foundries—machine shops, etc., etc., and in every case, give both the manufacturer and jobber a square deal by eliminating the fallible human factor and substituting *errorless machine accuracy.*

Automatic Toledo Scale *Springless*

A Distinctive Feature—The Portable Scale Needs No Levelling

On jobs impossible to take to a dormant scale, the **Toledo** Portable, *without levelling or balancing is instantly ready for use.* This floating compensating pendulum counter-balancing mechanism is *found in no other scale made*, and the increased accuracy and the saving in time it creates, is *alone* reason enough for specifying "**Toledos.**"

TEN DAYS FREE TRIAL—IF YOU USE THIS COUPON

There are other big features of Toledo Heavy Capacity Automatic Scales which will interest you. Let us show you why over One Hundred and twenty-five Thousand users have found the Toledo Principle most satisfactory and tell you what many of them say regarding its advantages over other methods of weighing.

Both our Portable and Dormant scales are made in weighing capacities from 250 to 1500 lbs. Small counter scales from 20 ounces to 115 lbs. We furnish scales equipped with metric system charts.

Mail us this coupon for our ten day free trial offer and catalog giving complete information.

TOLEDO SCALE COMPANY, TOLEDO, OHIO
Department C

Canadian Factory: Windsor, Ont. **Offices in all large cities**

TOLEDO SCALE COMPANY
Dept. C, Toledo, Ohio

Please send your Ten Day Free Trial Offer and Latest Catalog.

Name .....

Firm .....

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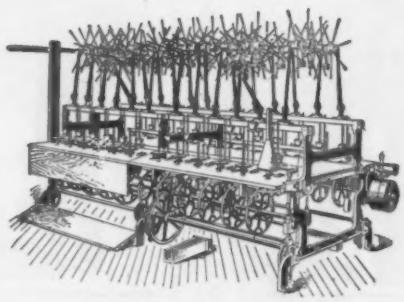

Special Announcement

To notify the trade that the recent Patent for winding machines which we own will positively eliminate the serious troubles that have been so difficult to master.

This idea will revolutionize the winding machine business. Although new it has been used long enough to eliminate all doubt of its success. We will guarantee the machine to do all we claim. This will be appreciated; for it is what has been needed ever since Hosiery Bobbin Winders have been in existence.

Too much cannot be said in praise of the merits and simplicity of the invention, nor of the results to be obtained.

We can prove this winder will be the best and most successful.

It is an entirely new departure from anything previously in use, and as it can be applied to our machines, it will revolutionize successful winding.

You can wind bobbins of varying diameters on the same spindle, traverse the yarn positively and prevent any overlaps. It will also permit yarns that are soft spun to be wound soft. Come and see it in operation. You will see that what it can do merits your consideration.

JACOB K. ALTEMUS

ESTABLISHED 1865

Textile Machinery

2824 N. Fourth Street, Philadelphia, Pa., U. S. A.

FAIRBANKS SCALES

We offer you the benefit of our superior facilities, buying power, broad experience, and skilled engineering force.

Whatever service we can render you to help solve your problems in so far as they may be effected by the comprehensive **Fairbanks** line of mill equipment and supplies is at your disposal without charge.

And should this service lead you to place an order with us you will find **Fairbanks** prices based on the principle of

LARGE BUSINESS AND LIVING PROFITS

FAIRBANKS

AUTOMATIC SPRINGLESS DIAL SCALES

— Have but few parts
— Are extremely simple
— Give weight instantly
— Are absolutely accurate
— Have Auxiliary Beam
— Have Tare Beam
— Dial is 30 inches diameter
— Capacity 1 to 3000 lbs.
(R. & S. Type has capacity of 1 to 5000 lbs.

FAIRBANKS DIAL ATTACHMENT can be attached to any Dormant Scale.

THE COUPON IS FOR YOU CUT IT OUT AND SEND TO US

The Fairbanks Company T.W.R.
32-44 Pearl St., Boston

Gentlemen:—Please send without cost or obligation information or catalogs on subjects checked below:

Automatic Scales
Dial Attachment for Scales
Portable Cotton and Wool Scales
Power Transmission Appliances
Elevating and Conveying Machinery
Valves **Trucks**
Belting **Gas Engines**

Remarks .....

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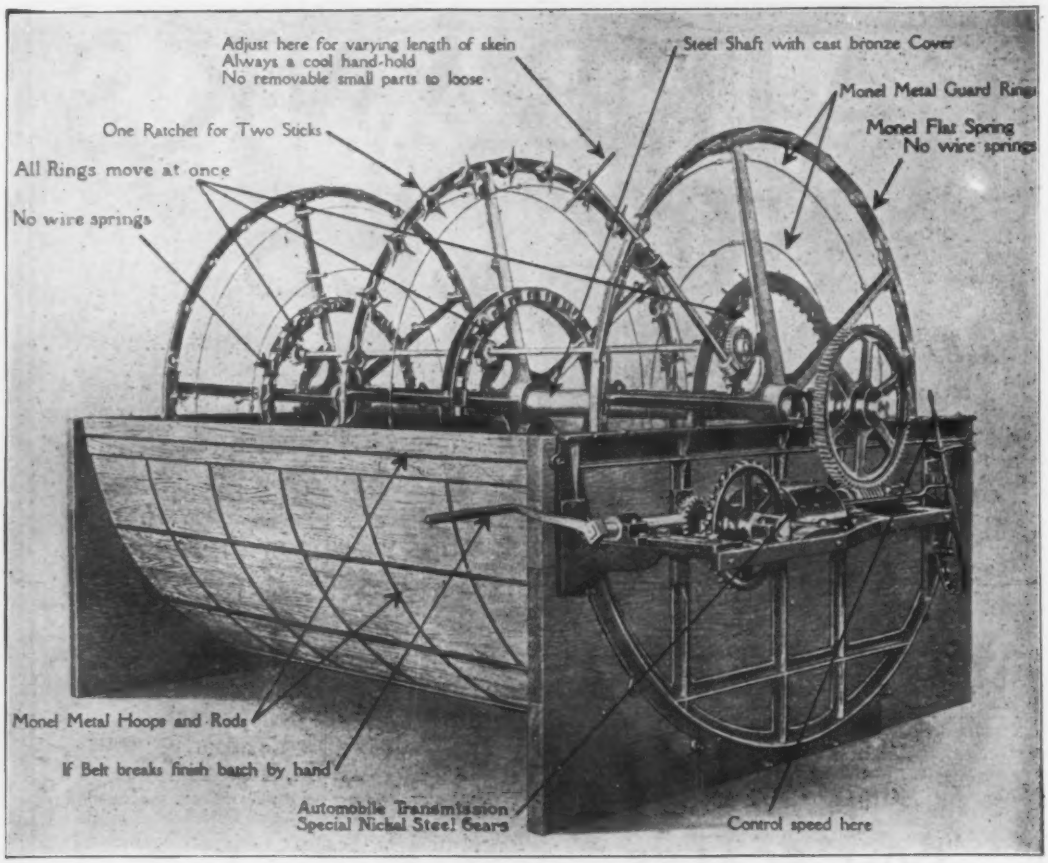
Yours truly,

Name .....
Firm Name .....
Street .....
City ..... *State* .....

THE FAIRBANKS COMPANY

32-44 PEARL STREET BOSTON, MASS.

Factory No. 1, St. Johnsbury, Vt. Scales and Valves
Factory No. 2, Binghamton, N.Y. Valves
Factory No. 3, Rome, Ga. Trucks and Wheelbarrows


Adjust here for varying length of skein
Always a cool hand-hold
No removable small parts to loose
Steel Shaft with cast bronze Cover
Monel Metal Guard Rings
Monel Flat Spring
No wire springs
One Ratchet for Two Sticks
All Rings move at once
No wire springs
Monel Metal Hoops and Rods
If Belt breaks finish batch by hand
Automobile Transmission
Special Nickel Steel Gears
Control speed here

GILES MODEL BB ALL BRONZE, 50 STICK SKEIN DYEING MACHINE WITH TOP REMOVED TO SHOW MECHANISM

Imitation is the Sincerest Flattery

The many improvements incorporated in the John H. Giles Dyeing Machine have been so marked and have received such favorable comment among the dyers and master mechanics, that certain of our competitors, in order to hold their trade, have been compelled to imitate these improvements.

This imitation establishes beyond doubt the superiority of the Giles Skein Dyeing Machine.

This machine was shown at the Textile Exhibition at Boston during the entire show at spaces 176 and 177.

Our machines are built under the Leonard Weldon Patent No. 645,698 and other patents pending.

John H. Giles Dyeing Machine Co.

Amsterdam, N. Y. **Taunton, Mass.**

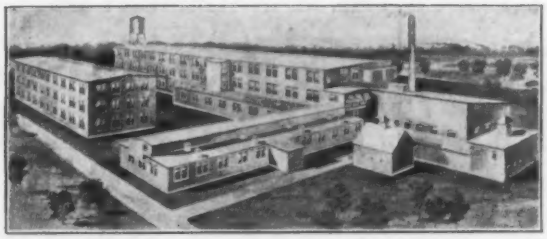
PETER B. MCMANUS
Pres. and Treas.

EDWARD J. MCCAUGHEY
Secy. and Mgr.

JOHN MCMANUS
Vice-Pres.

Home Bleach and Dye Works

INCORPORATED



Dyers, Bleachers and Mercerizers of

Cotton Yarns

in skein and long and short

Chain Warps

Fast Colors a Specialty

Daily Capacity, 40,000 lbs.

Fast Colors and Black for Worsted Trade

Office and Works, Pawtucket, R. I.

Established 1881

Established 1791 | 124th Year

UNDER THE MANAGEMENT OF

J. E. CONANT & CO., Auctioneers

OF LOWELL, MASSACHUSETTS

THE business of systematic preparation for absolute auction sales and the thorough and effective advertisement of such sales have become of as much importance in the successful liquidation of large manufacturing properties as has the clearing house system to the national banks.

The danger is more apparent than ever before of leaving the management of the sale of large manufacturing or other properties to the amateur, the layman, or the inexperienced.

For one office to prepare and make the catalogue of a property for sale, for another office to advertise the sale, and for a third office to sell the property means disaster from the start.

The following absolutely necessary for complete success in any sale must, in addition to the dealer and speculator, comprise the actual user, the actual consumer, and the purchaser who buys because of home demand.

A well grounded knowledge of and much familiarity with the property in hand are positively essential to the intelligent handling of the same for sale.

The sale value of many properties is depreciated by indecision as to what to do, dilatory and waiting methods. The time to sell any property is immediately and at once it is for sale, from that moment it commences to grow common and become stale.

Combinations not endured.

Within this century (thirteen years) the management of the sale of some two hundred and fifty manufacturing properties situated in seventeen different states of the country has come to hand unsolicited — an experience without precedent.

How a property should be divided, in what order it should be sold, in what manner presented to the public, and who should be notified, are not matters of opinion but purely those of experience.

Entire Transaction — from Start to Finish — Taken in Charge

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Textile Engineer

200 FIFTH AVENUE, - - NEW YORK

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Saechsische Webstuhlfabrik

(Louis Schoenherr)

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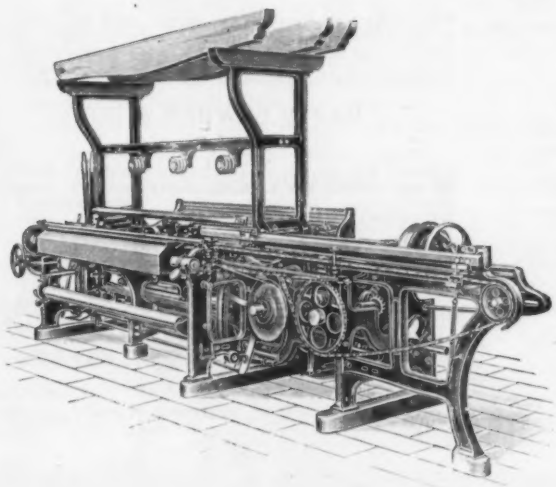

NEW:

Combined *Carpet Shearing*, brushing and steaming machines, 20 feet wide

THE CALL IS FOR

Seamless Rugs

The Schoenherr Loom for seamless

Velvets
Brussels
and Wiltons

is the product of 60 years experience in loom construction.

Built 4/4, 6/4, 8/4, 12/4 and 16/4 wide

CONSULT ME

Textile Machinery Specialists

Complete Equipments for Woolen, Worsted and Silk

J. B. FARRAR & SONS, LTD.
Halifax, England

WORSTED MACHINERY.

Preparers, Gill Boxes, Drawing Boxes, Open and Cone Reducers and Rovers. Spinning Frames for Cap, Flyer and Ring. Trap Twisters for Cap, Flyer and Ring. Stop Motion Twisters for Ring and Flyer. Stop Motion Redoublers for Carpet Yarns. Bundling Presses. Gassing Frames, and Yarn Finishing Machinery. Also **AUTOMATIC CAP AND FLYER DOFFING FRAMES.**

BOLDY & SON, LTD.
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HOT AIR BACKWASHERS with Sowden's Patent Corrugated Perforated Cylinders. Continuous Circulation. Moisture Instantly Removed. Thus Avoiding All Danger of Discoloring and Scorching Stock. Drying Capacity Far in Excess of Any Other Machine Made. **LISTER NIP COMBS,** Single or Double Head. **DEGRAS PLANTS COMPLETELY EQUIPPED.**

JOHN DAWSON, LTD.
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PATENT WOOL WASHERS, Single and Double Motion. The Most Perfect System of Wool Washing. **AUTOMATIC ACID AND CARBONIZING MACHINES.** Special **THERMOMETERS** for Wool Washers, etc.

JAMES SMITH & SON
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IMPROVED NOBLE COMBS AND BALL WINDERS. The Most Modern and Up-to-Date Machines Made. **REPAIR PARTS** for all Makes of Combs. **CUT GEARING,** All Sizes, Kept in Stock.

S. HALEY & SON, LTD.
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CARD CLOTHING for Woolen, Worsted, Cotton and Silk. Patent **BALATA** Foundations, Oil and Waterproof and of Great Tensile Strength, or Ordinary Foundations.

SELAS COMPANY
New York, N. Y.

Also at Berlin, Manchester, Moscow and Paris

ILLUMINATING AND INDUSTRIAL HEATING SYSTEMS. Economies in Lighting from 40 to 80 Per Cent., and for Heating, Singeing, etc., from 15 to 40 Per Cent. All Installations Fully Guaranteed.

JOHN HETHERINGTON & SONS, LTD.
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WOOLEN AND WORSTED MACHINERY.

WORSTED CARDS. Special Designs for All Classes of Wools, together with Burring Devices. **WOOLEN CARDS,** Duplex and Belgian Systems. **TAPE CONDENSERS,** Single and Tandem Rubbers to Take Off Up to 240 Ends and All of Equal Size. **WOOLEN AND WORSTED MULES,** with All Metal Carriages. **WILLOWS, FEARNAUGHTS, DUSTERS, FEEDS, ETC.**

MASCHINEN-FABRIK VORM F. J. GRÜN
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IMPROVED MACHINERY for Preparing, Combing, Drawing and Spinning Worsted Yarns on the **FRENCH SYSTEM,** with Mule or Ring Frames. **INTERSECTING AND MIXING GILL BOXES, SPECIAL MACHINERY** for Preparing, Drawing and Spinning Yarns from **SILK, SILK WASTE, RAMIE AND COTTON WASTE.**

SKENE & DEVALLEE
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VIGOUREUX PRINTING GILL BOXES, with Ordinary Single Print Rolls or with Gaydet's Patent Double Cross Print Rolls. With Piel's Patent Screws and Fallers. Better Mixes and Larger Production is obtained Than on Any Other System.

DAVID SOWDEN & SONS
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LOOMS for Men's Wear, Dress Goods, Linings, etc. **DOUBLE PLUSH LOOMS. IMPROVED DOBBIES,** Single and Double Action. **IMPROVED JACQUARDS,** Single and Double Lift.

HEARL HEATON & SONS
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EMERY FILLET, Plain and Grooved, All Numbers. **CARD GRINDING FRAMES, ROLLS, ETC.**

WILSON & CO., BARNSLEY, LTD.
Barnsley, England

HIGH-CLASS MILL BOBBINS. Plain or Fitted with Patent "Lockfast," "Climax" and "Simplex" Shields or Protectors.

Importers and Manufacturers of Mill Supplies, Specialties, etc., for Worsted Mills

PLANS AND ESTIMATES FURNISHED

Sole Agents for United States and Canada

SPEED & STEPHENSON

BOSTON, - MASS.

SEND FOR CIRCULARS

Are You a Leader or a Trailer?

YOU CAN DO IT WITH A REO

Traffic experts have figured that in only a few years from now 90% of the commercial hauling will be done by motor trucks.

Already, in the textile field, manufacturers and jobbers are using Reo Motor Trucks, and finding their use profitable, not only in cutting down the cost of hauling, but in speed of service, which many times is all-important.

The Reo Truck is equally efficient in hauling raw material or finished goods, and does away with the worry and uncertainty of horse-hauling—and at a lowered cost. ¶Reo Motor Trucks have won the approval of shrewd, carefully calculating business men in every line of industry—not only because of the remarkably low cost, $1650 for chassis with driver's cab, but because it has so many essentially modern and progressive features not found in other motor trucks.

Here are some of the features that mark the Reo as the most advanced type of medium heavy-duty motor truck now on the market: Reo Sectional Radiator, of 24 separate interchangeable units, may be repaired on the road anywhere; motor, clutch and transmission are cushioned on a sub frame, away from jars and road-shocks; left side drive, and the best and handiest center control ever brought out; big armored front frame; demountable driver's cab; gas headlights and Prest-O-Lite tank, and many other details of design and construction that mark the utmost advance in modern engineering practice. ¶ These features mean sure, unbroken service, low upkeep cost, and that wide margin of safety that a motor truck must have to meet the frequent emergencies of extra service, bad roads and overloading, that cannot be otherwise forestalled.

GET AHEAD OF COMPETITION

Don't wait until your competitor forces you to use motor trucks. Be a leader and enjoy the profits and prestige that go to the man who uses modern methods and equipment. We will gladly assist you with facts and figures, if you will tell us the conditions under which you are working. A Reo Truck Catalog and other helpful information at your disposal. Write today.

REO MOTOR TRUCK CO., LANSING, MICH.

$1650
F. O. B. Lansing
Chassis Only
Body Extra

REO
Model J
Two Tons Capacity

"THE SKYLIGHT BUILT OF STEEL"

Slowly and surely the problems of increased mill production are being worked out. Two answers are already agreed on—good light, good air. You must have light to work right, air to work long.

To many of the expert Architects and Engineers, who aid profits by adding to production, the proved requirement has been the

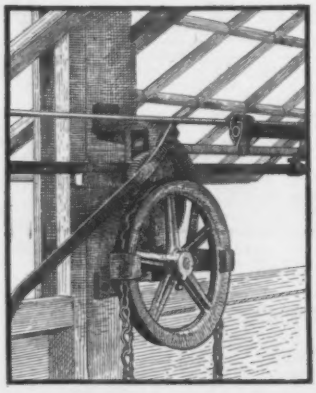
Made of Steel for flat, sawtooth and double-pitch skylights.

ANTI-PLUVIUS
(Trade Mark)
Puttyless Skylights

Made of Steel for all classes of mills and buildings.

The STRAIGHT PUSH Sash Operator distributes the right amount of air at the right time, easily and evenly. Controls 10, 100 or 200 foot units by one man, at one place, at one time. Big ventilation with little effort. Better the expense of one good system of sash operating than experience with many poor ones.

WEARPROOF AND TROUBLEPROOF—WATERPROOF AND FIREPROOF

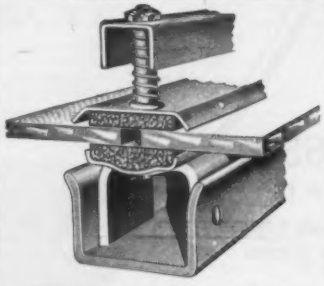


"STRAIGHT PUSH"
SASH OPERATORS

This is a superior device for the quick and easy handling of long lines of sash at one operation. It works on the push and pull principle, and cannot bind, jam, clog, or catch.

It is needed in mills for ventilation purposes and for shutting fire either in or out, as the case may be.

Send for interesting photograph of tests.



This is a detail cross section view, showing the construction of

"Anti-Pluvius" Skylights

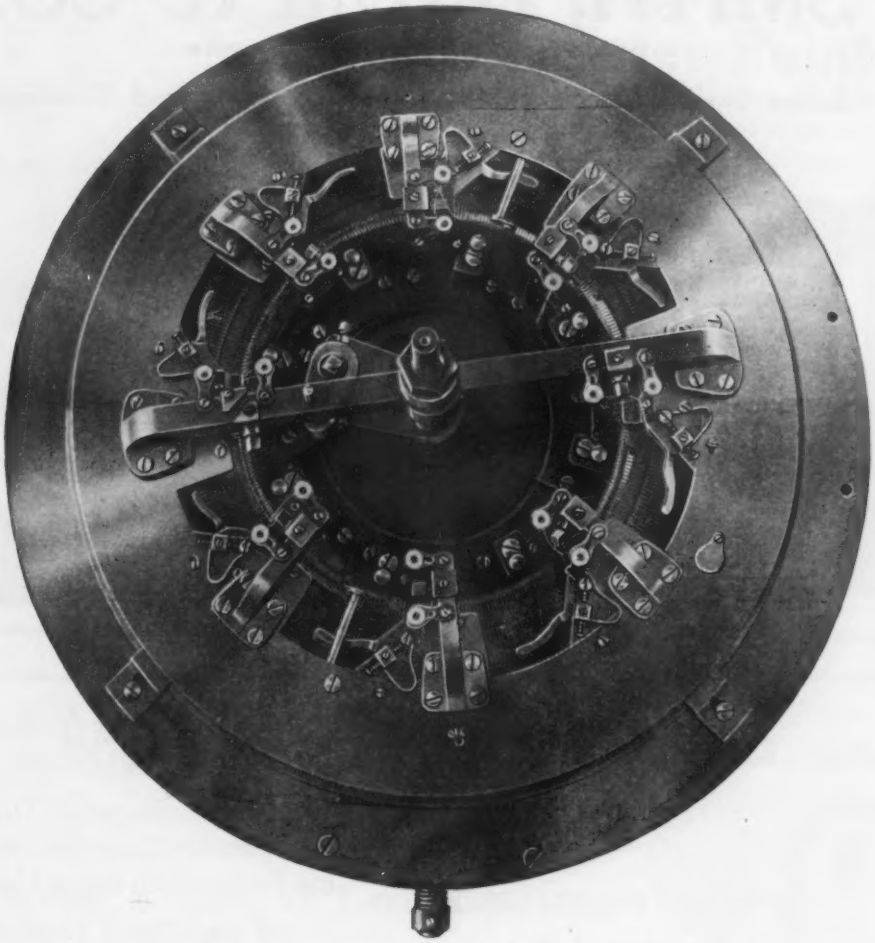
Note that glass is bedded in cowhair felt, and is free to move with expansion or contraction, yet remains positively watertight.

We are sure of one thing. We have a skylight catalog worth your writing for today.

The G. Drouvé Company - Bridgeport, Conn.

180 N. DEARBORN ST., CHICAGO

"IN A CLASS OF ITS OWN"



TOP VIEW OF

LEIGHTON MACHINE FOR RIBBED UNDERWEAR

WHICH IS

BUILT RIGHT TO KNIT RIGHT

PRODUCING THE

MOST ELASTIC, SOFT WEB

GET A COPY OF OUR NEW ILLUSTRATED CATALOGUE
FOR PARTICULARS ADDRESS

Leighton Machine Company, - Manchester, N. H.

SMITH, DRUM & CO.

"BUILDERS OF THE BEST"

Labor Saving Machinery for Dyeing, Singeing and Finishing

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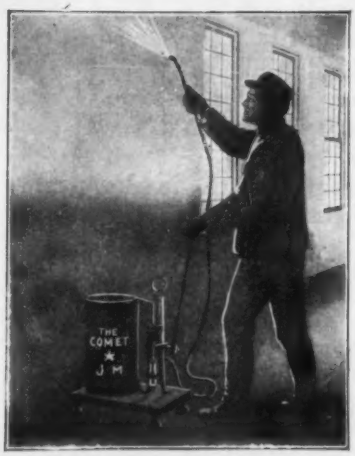

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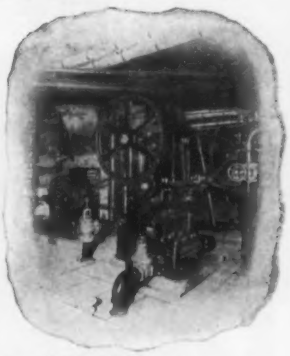
A change in the pumping equipment of the plant illustrated



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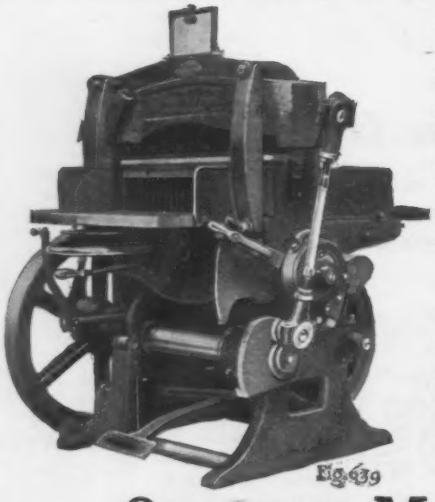

Fig. 639

at a great economy of time and cloth is possible on the NEW OSWEGO AUTOS, equipped with back gauge size duplicating attachment and any length of iron back table desired, and other equipment especially adapted to each case for the most rapid production. The instant adoption of the OSWEGO Cutters by many progressive American firms indicates their success on all kinds of textiles, etc.

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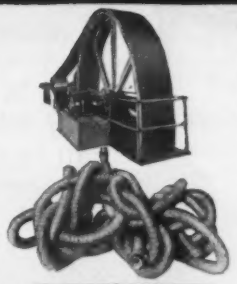

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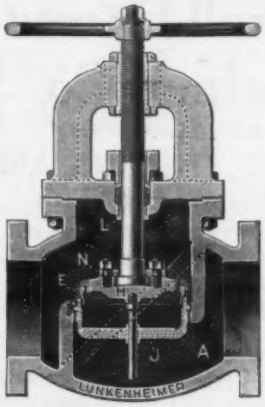

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comprising Globe, Angle and Cross, Horizontal, Angle and Swing Check, Gate, Throttle, Non-return Boiler Stop, Lever, Screw Down Check, Pop Safety, Relief, Blow-off Valves, etc., in all standard Sizes and a variety of designs and weights, to comply with any requirement of pressure.

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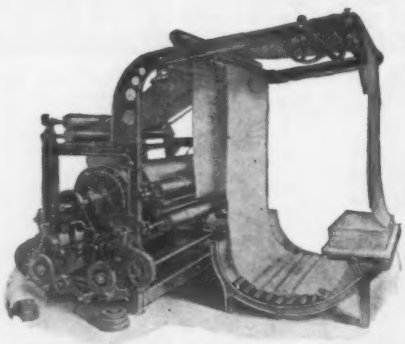

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Convenience Durability and Production

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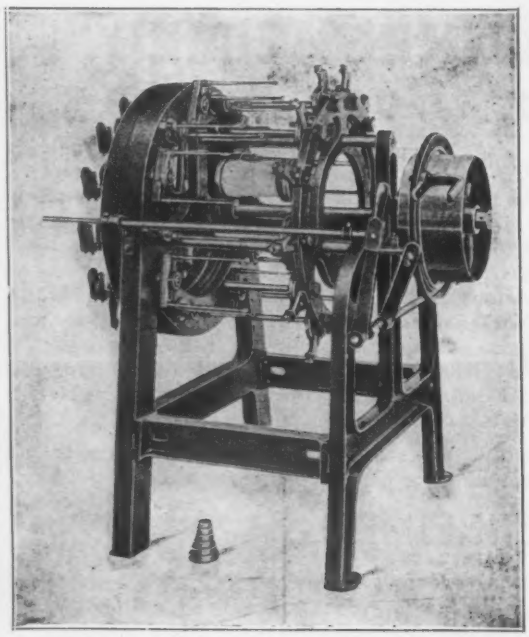

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The Haskell-Dawes Machines are built upon a NEW PRINCIPLE whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope.

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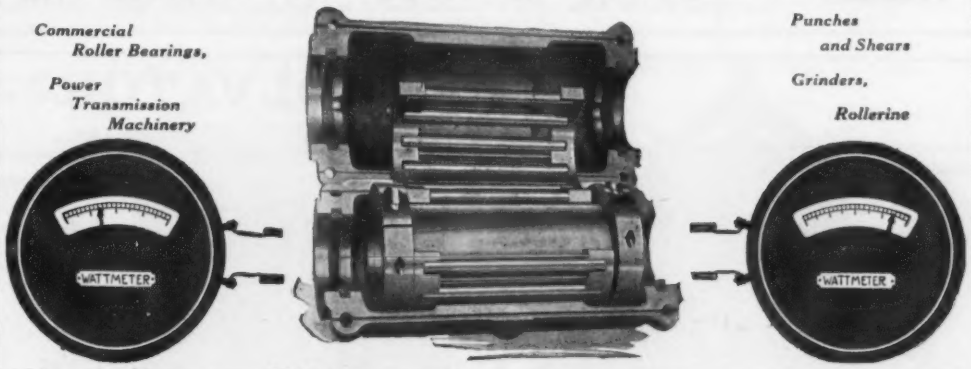

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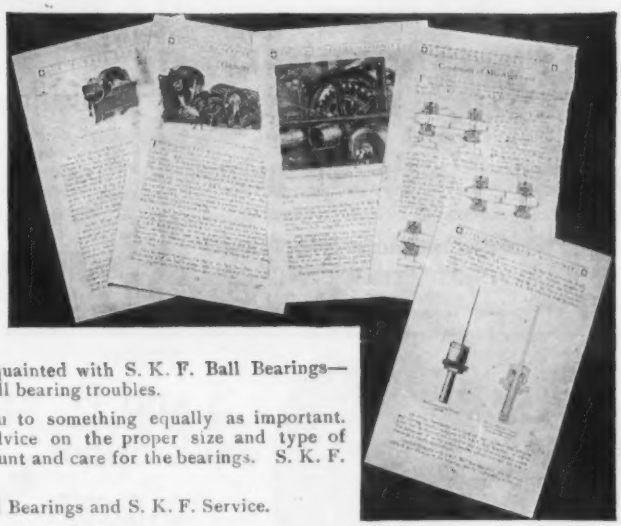

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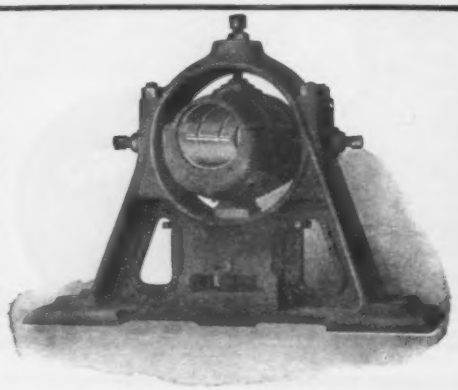

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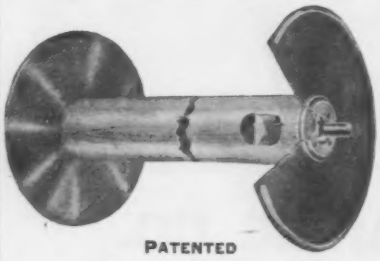

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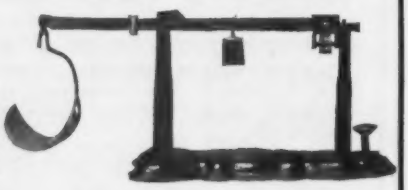

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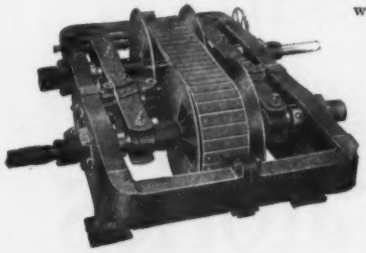

with which the speed of any machine may be increased or reduced with

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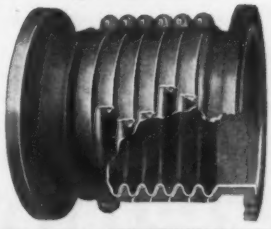

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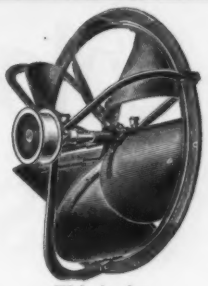

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A Complete Directory of Cotton, Woolen, Knitting, Silk, Flax and Jute mills of the United States and Canada, together with the Dyeing and Finishing Works, Bleacheries, Print Works and other Textile Establishments; about 7,000 in all. Full information is given about each mill in almost every instance, viz., the name of the company or firm, names of officers, agent, superintendent, the character of goods made, the machinery equipment, i. e., the number of sets of cards (or combs), the number of spindles, number of looms; whether the mill uses steam or water power, whether there is a dye house or not, the names of the selling agents or if the mill sells direct. All this and much other information contained in this book is arranged in a way to be instantly accessible.

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A mild yet efficient detergent. Imparts a soft feel and represents a considerable saving in shrinkage as compared with more powerful alkalis

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247 ATLANTIC AVENUE
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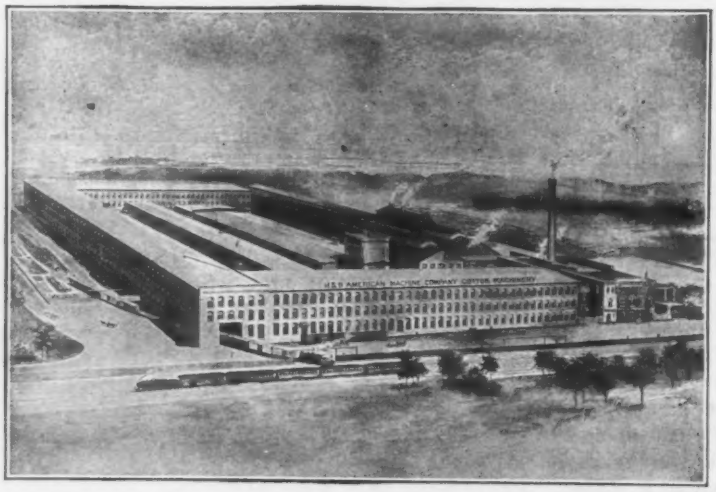
Contents for May

	PAGE
Monthly Comment	67
The Wool Goods Market	75
The Annual Convention of the American Cotton Manufacturers Association	77
The National Association of Cotton Manufacturers	93
The Textile Exhibition	129
CORRESPONDENCE AND NOTES	193
European Methods of Carbonizing Raw Stock and Pieces — Bedford Cord for the British Army — English Notes — Conditioning Textiles at the Custom House — A Hand Book of Weaves — The Manufacture of Elastic Fabrics.	
QUESTIONS AND ANSWERS	205
KNITTING DEPARTMENT	213
The Knit Goods Situation — The Scott & Williams System of Hosiery Knitting Machines — The New Hoff-man Press for Hosiery — Variation in Length of Hosiery — The Ames Hosiery Knitting Machine — Knitting on a Fourteen-Cut Frame — An Improved Hosiery Frame — Manufacturing Hockey Caps.	
DYEING, BLEACHING, FINISHING, ETC.	223
Preparation and Printing of Woolen Fabrics — Starching and Blueing Cotton Piece Goods — After Treatment for Substantive Colors — A Dyeing and Scouring Machine — A Sulphur Bleach House — Dye Recipes.	
NEW MACHINERY AND PROCESSES	231
PERSONALS	242
NEW PUBLICATIONS	248
BUSINESS LITERATURE	249
INDUSTRIAL NOTES	249
RECENT TEXTILE PATENTS	255
RECENT TEXTILE TRADE MARKS REGISTERED	256
PUBLISHERS PAGE	272
MILL NEWS	313 to 344
WOOL MARKET	315
BRADFORD MARKET	317
COTTON MARKET	319
YARN MARKET	321
RAG AND SHODDY MARKET	331
SILK MARKET	333
DYESTUFFS AND CHEMICALS	339
MILL STOCKS	343

Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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TEXTILE WORLD RECORD

MAY, 1914

Monthly Comment.

Living Under Free Trade and Protection

Editor Textile World Record:

The article, "Living Under Free Trade," in your April number, which includes an extract from an article in the "Manchester Guardian," was read by me with particular interest because it was only an hour or so earlier that I had read an article in the "Detroit Evening News" of Saturday, April 18th, dealing with housing conditions in Detroit. To quote from your comment on the Manchester article:

> "The efforts to ameliorate the housing conditions bring out clearly the hopelessness of any real solution in Manchester under the present fiscal policy. . . . In the very nature of things, the present efforts can only slightly ameliorate conditions. The only real remedy is to be found in a removal of the underlying cause, which is free trade with its tendency to concentrate within narrow area the industrial and commercial activities for supplying a demand from wide areas, to the physical, social and financial detriment of both British producers and foreign consumers."

Aparently it is proved without the shadow of a doubt that the rather hopeless condition of the Manchester poor is due wholly to free trade conditions under which they are living.

Following is a brief extract from the article in the Detroit Evening News, to which I have referred:

> A row of tenement houses is further down the street in which No. 680 is the most conscicuous. A two-story frame structure unfit for human habitation brings $42.00 a month. In the dingy rooms of the lower floor are housed five persons, who, by one way or another, pay $25.00 a month for the privilege of living there. The upper rooms, which are in even worse condition, net the landlord $17 per month and have brought more in times when fewer people were out of employment. Another house in the same row has brought as much as $56.00 a month, but the price has been lowered because of a dearth of tenants."

I enclose the "Evening News" article that you may have an opportunity to read the whole of it and see the photographs of actual conditions if you wish to do so.

If free trade brings about the housing conditions that exist in Manchester, what is the underlying cause in Detroit? This, it strikes me, is a fair question, as we certainly are not overburdened with free trade in the United States. In fact, we are, or have been until very recently, perhaps the most highly protected country in the world. Is it not true that the English editor reading the "Evening News" article, might with logic equal to your own, print extracts from that article and refer to them as proving conclusively that the horrible living conditions in Detroit were the result of a protective tariff?

It seems to me that a man with an open mind must assume that both deductions could not be correct. I believe it is logically shown that it is neither free trade nor a protective tariff that is responsible for these conditions. If the cause in England is free trade, we, in the United States, with our high protective tariff, should not be confronted with these conditions, but, as a matter of fact, we are. If the cause in the United States is our protective tariff, then they in England should be free from these conditions, but the "Manchester Guardian" proves that they exist. Now, Mr. Editor, let us look further. Let us visit Victoria, B. C., Canada, and quote from an advertisement of the Albion Trust Company, Ltd., of that city. In quoting from this advertisement, and in reading it, let us remember that we are not reading from the mutterings of some visionary reformer, but from the paid-for advertisements of a sound commercial institution that is in the business of making money. This advertisement is under the caption "Share Our Prosperity":

Western Canada is today the most prosperous country on earth. This is partly due to enor-

mous natural resources just being developed, to the immense sums being spent on railroad construction, and in and near Victoria to what Rudyard Kipling says is "The finest climate on earth," but is also very largely due to the commonsense tax laws and the immigration they induce. The partial application of Henry George's single tax ideas in Victoria and Vancouver worked so well that every town, every city and every province in Western Canada is working for their full adoption.

Here it is no longer a greater crime to build a chicken house than to rob one, as it is in every county of every one of the United States.

Men are not punished for building homes, stores, or factories, or for raising crops or cows. Homes, factories, cattle and all personal property are exempt, and taxes are levied on land values and natural resources.

This tends to prevent monopoly and to increase wages, profits and interest. If you can't come here mail us your money and we'll make it earn more for you than you can get at home. One dollar will start an account. Just mail it to us. We pay 4 per cent. on savings and 5 per cent. on debentures and time deposits.

Albion Trust Co., Ltd., Victoria, B. C., Can.

If, Mr. Editor, the cities of Manchester and of Detroit and of Boston should advertise in a similar manner not to penalize the builders and owners of respectable houses and livable tenements, and should advertise further that the owners of villainous tenements such as those under consideration, should pay just as much taxes provided the land was of equal value, as the owners of respectable tenements, don't you think that some of these old, unsanitary, tuberculosis-breeding places would soon be pulled down and make way for real homes for people who would soon become self-respecting, even though they may not be so today?

No, my dear sir, it is not free trade and it is not wholly a protective tariff that produces the misery of the poor. You must look further and I hope that you will eventually see the cat.

Yours very truly,

A. Laurence Smith.

It is a self-evident fact that free trade tends to concentrate within narrow limits the industrial and commercial activities for supplying the demand from the entire free trade area for transportable products. Lancashire, England, is a remarkable illustration of this fact. Great Britain forces free trade on India and other crown colonies. Cotton goods constitute the most important item in British exports to these colonies, and the manufacture of these goods is concentrated in the little county of Lancashire, where in an area of 1,880 square miles are found a population of 4,825,739 and 55,971,501 cotton spindles, or nearly 40 per cent. of the total spindles throughout the world. In 1907 the cotton goods manufactured in the United Kingdom, practically all in Lancashire, were valued at $845,484,480. It is estimated that three-quarters of this quantity of goods is exported, the British exports of cotton goods last year, 1913, amounting to $618,225,145. Thus within an area smaller than that of Delaware is concentrated the manufacture of this immense quantity of cotton goods, of which $618,225,145 worth, equal to the value of the goods manufactured in all the cotton mills of the United States in 1909, was shipped to distant countries to supply people who under protection which they desire but are not allowed to establish, could manufacture to advantage the great bulk of these goods themselves.

That is the chief factor in crowding a population of nearly 5,000,000 into an area equal to that of Marquette County, Michigan, giving an average of 2,567 persons per square mile. The result is the hopeless condition of overcrowding in Manchester, to which we called attention last month. Mr. Smith thinks that a solution of the housing problem in Lancashire will be found in a single tax on land, but he is evidently not acquainted with the municipal housing schemes at Manchester, which have failed to solve the problem although carried on under conditions offering advantages equal to if not greater than those of a relief from the tax on the buildings. During the past twenty-four years Manchester has spent $2,158,228 on its housing schemes, and last year the housing accounts showed a loss of $68,953. As a result of this failure of the municipal scheme, the Manchester City Council recently voted not to build more houses, and also resolved to increase from $1.68 to $1.74 per week the rents of some of the houses already built. The protest of the tenant against this small increase (6 cents a week) disclosed the deplorable housing conditions to which we referred last month. Six cents a week is small only by comparison. It may seem small in Detroit, which a minimum wage of $5.00 a day has recently made famous, but it is large to the worker trying to keep a family alive on $4.86 a week. The following from the Guardian will help us to

understand how large 6 cents a week is to the tenants of free-trade Manchester:

> The main road (off Middleton Road) is four and a half miles from Alvert Square; the fare by tramcar from the city is three half pence, and with the possibility of stoppage it is impossible for a worker to do more than leave home in the morning and return at night. There is to be found one of the problems of economic home arrangements for the poorer class of workers. Eighteen pence a week in traveling fares means much on a wage of twenty shillings ($4.86).

The facts we have stated show beyond question that the cause of overcrowding in Lancashire is the concentration of manufacturing and commerce to supply cotton goods to people in distant countries, who would be much better off if they were encouraged by a protective tariff to make the goods for themselves. Mr. Smith says:

> What is the underlying cause (of overcrowding) in Detroit? This, it strikes me, is a fair question, as we certainly are not overburdened with free trade in the United States?

The cause is the same, the concentration of industry and commerce within a small area to supply the demand for a large area. Mr. Smith is right in saying that we are not overburdened with free trade in the United States, although we have more of it than any other nation on earth. The advantages of free trade between the States are so great as to make absurd the proposition to separate them by tariffs. At the same time the law of industrial concentration is operative here as in Lancashire. Illustrations of this are found in every trade. In our June, 1912, issue we called attention to the one supplied by the concentration of the knitting industry at Little Falls, N. Y. Another striking example is found in Wayne County, Mich., of which Detroit is the county seat, and which with an area of 626 square miles had in 1910 a population of 531,591, or 849 per square mile, while in 1910 the products manufactured in Detroit alone were valued at $252,992,000. In ten years, from 1900 to 1910, the population of Wayne County, Mich., increased from 557 to 849 per square mile, and during the same period the manufactured products of Detroit jumped from $88,366,000 to $252,992,000. At this rate Wayne County, Mich., will soon rival Lancashire for concentration of population and volume of production. And in both localities concentration brings its attendant evils of overcrowding.

Whether a single tax on land would prove a remedy for the evil is a question distinct from the determination of the cause. Mr. Smith's quotation from the advertisement of a British Columbia promoter does not strengthen our confidence in that tax as a remedy. It is but a few months ago that an investigating committee of the United States Senate uncovered the fact that for years the Canadian Government had been paying for grossly misleading advertisements and articles in the newspapers of the United States in order to induce farmers in various States to leave their homes and emigrate to the Canadian North West. If the Government itself sets such an example it is but natural to question the reliability of a Canadian corporation's prospectus in which we are advised to go to Canada and share Canadian prosperity, but if we cannot go, then to send our cash in amounts of one dollar and upwards to the promoting corporation. Furthermore the failure of the Manchester municipal housing scheme should moderate Mr. Smith's confidence in the single tax as a remedy. We have no desire or occasion to combat or endorse the single tax on land in this connection. Our object is to show the cause of the congestion at Lancashire and elsewhere.

The essential difference between American and English conditions is that here the evil can be remedied, while in Lancashire a remedy is impossible except by a removal of the cause, free trade. Manchester has tried for nearly a quarter of a century to solve the problem—and has failed because of low wages and lack of room. Mr. Smith's letter, the "Evening News" article and the high wages which we know are paid in Detroit, make it reasonably certain that the evil of overcrowding exists in that American city because the State and municipal authorities have not been forced to apply the remedy.

That is why the English editor reading the "Evening News" article cannot use the conditions at Detroit against protection as we have used the conditions at Manchester against free trade. We hope Mr. Smith sees the cat.

The Treasury Department and the Cotton Tariff

J. Sachs & Co., Importers,
New York, April 25, 1914.

Editor Textile World Record:

The Treasury Department is again criticized on page 60 of the April issue of the Textile World Record for its rulings and methods in determining the average yarn number of cotton cloth under the present tariff. The percentage of regain for moisture has been settled at last to your satisfaction—and to ours.

You attack the ruling that if the yarn number is found to be within 4 per cent. of a dividing line the cloth shall be conditioned. We have no objection to the customs officials conditioning all cloths whether within 4, 5, 8 1/2 or 20 per cent. of any line, if they have the time or any benefit will accrue to the revenue.

You err in your quotation from the Department letter which you state as dated March 10 (another error). In the last paragraph of the letter quoted you twice print 4 per cent. where the latter states 5 per cent. Then to show that it is not a typographical error you follow your quotation by the statement that on November 25 in a letter to you the Department "virtually abandoned" the 4 per cent. limit. Had you read the Department instruction aright you would have seen that the Department had actually amended the percentage, and your comment would not have been "both mistakes may be considered as corrected."

We do not admit the 4 per cent. limit to have been a mistake. The 1 per cent. difference is too small for quibbling, and had you a better knowledge of customs administrations you would not make the statements you do. We interpret the Department instructions to have been that within 4 per cent. of the dividing lines the cloth must be conditioned. Beyond the 4 per cent. it was optional with the examining officers, and they could condition regardless of the percentage when they thought any attempt was being made to practice fraud or subterfuge.

The method prescribed by the Department for calculating average yarn number is indeed laborious, but the necessity for making any calculations whatever was removed by the tables prepared by J. L. Hollings, examiner of cotton goods at this port. With these tables at hand we count the threads, weigh the 16 square inches (or a square yard if preferred) and then refer to the Hollings' tables which give us the rate of duty without any calculations on our part. These tables must have entailed a large amount of work in their preparation and for importers and customs officials the tables have obviated all computations. In all fairness you should so admit.

We have tried the 4.32 square inch sample which you so strongly advocate and the 16 square inch sample adopted by the Government, and we are obliged to admit that for the finer fabrics now in vogue and for many cloths imported this season the small sample you so ardently champion, weighed on most balances, does not give as satisfactory and accurate results as does the larger sample.

Very truly yours,
C. W. MacDonough.

The error in our April report of the Treasury ruling, to which Mr. MacDonough calls attention, was due to our having accepted a news report of the ruling as correct when the decision was first announced. If Mr. MacDonough will refer to page 142 of the same issue (April) he will find a copy of the decision taken from the official report and giving 5 per cent. instead of 4 per cent. as the limit within which cotton cloth is to be conditioned when determining the Underwood duties. The change from 4 to 5 per cent., however, makes not the slightest difference in our contention. Our objections are to any limit whatever, and not to the 4 per cent. limit alone. The limit of 5 per cent. which the Treasury Department has now adopted has no more justification than the 4 per cent. limit it has abandoned. Take for illustration a bleached cotton cloth having 180 threads per square inch. If a square yard of this cloth weighs 3.164 ounces with a regain of 8 1/2 per cent., the average yarn number is 39. The tariff law provides that number, 39, as a dividing line, above which the duty is 20 per cent. until another line is reached, and below which the duty is 15 per cent. The Treasury ruling as revised provides that the appraiser shall condition the cloth only when the actual weight falls within 5 per cent. of the weight at the dividing line. This means that if the cloth taken for illustration weighs between 3.0058 and 3.2222 ounces it will be conditioned, but outside of these limits, the actual weight would be accepted as the basis for the duty.

Suppose now that a cotton cloth with 180 threads per inch is presented for appraisal under such atmospheric conditions as prevailed at Boston on Jan. 27, 1912, when in a room heated to 70° F. the actual regain was 1.4 per cent., and that the actual weight of one square yard was found under such conditions to be 2.98 ounces. The appraiser would refer to the Treasury ruling, find that the weight was outside of the 5 per cent. limit, and would assess a duty of 20 per cent., whereas, if the cloth was conditioned, the weight would be 3.18 ounces and the duty would be 15 per cent.

This case can be stated as follows:

Actual weight ..... ounces 2.98
Duty under ruling ..... per cent. 20.
Conditioned weight ..... ounces 3.18
Duty should be ..... per cent. 15.

The ruling of the Treasury Department has decreased the duty 5 per cent. below the legal rate. Moreover the illustration is based on an ordinary variation in atmospheric conditions and takes no account of the possibility of deliberate fraud by means of dampening cotton cloth before appraisal to reduce the indicated yarn number and the duty. It does not seem as if any further argument were necessary to demonstrate the absurdity of all fixed limits of variation outside of which cotton cloth is not to be conditioned. Mr. MacDonough says that the arbitrary limit of 5 per cent. is optional with the customs authorities, and that the change from 4 to 5 per cent. is too small for quibbling. In that case the limit might as well be eliminated from the record.

The only imaginable object of a 4 or 5 per cent. limit is to save part of the time and labor involved in the operation of conditioning. It is easily conceivable that conditioning every cotton fabric in every invoice of goods imported into the United States or even at the port of New York would prove exceedingly burdensome for the customs authorities. If so, the remedy is easy, namely, to establish a testing room in which temperature and relative humidity would be automatically maintained at a point where the actual regain equals the conditioned regain, or 8 1/2 per cent. Then the duty could be determined directly from the weight of the sample. We made this suggestion over a year ago, in our April, 1913, issue, and we renew it now.

Mr. MacDonough is hypercritical in his reference to the "straight line" area of 1/300 square yard (4.32 sq. in.). An ordinary balance will indicate the weight to 1/100th grain, and if a greater area is desired, it should be made a multiple of the "straight line" area, 1/200th, 1/100th, 1/50th sq. yd. or a larger size in order to facilitate reduction. Everyone familiar with textile work knows, however, that 1/100th of a grain on the weight of 1/300th of a square yard of cotton cloth is a variation very much smaller than the common and unavoidable variations in the construction of a cut of cotton cloth. The object of the analysis for tariff purposes is to determine as closely as possible the average yarn number for the total amount of cloth in an invoice. To do this it is necessary to take into account the greatest variations, which occur from yard to yard through a piece of cloth. And this can be done only by weighing and measuring such a quantity of cloth as will cover the greatest as well as the smallest variations. The practice at the Boston custom house for years has been to weigh a whole piece of cloth in assessing duties. This insures a fair average covering the ever present irregularities in the construction of the goods, which are the chief cause of variation. Having weighed a large quantity, the degree of accuracy is the same whether the reduction is to 1 square yard 16 inches square, 4.32 square inches or 1 square inch. Mr. MacDonough shows how completely he misunderstands the problem when he speaks of the finer fabrics necessitating a larger area for accuracy. The fact is the reverse. The coarser the fabric, the greater is the need for a larger area in order to determine the average yarn number accurately.

Mr. MacDonough thinks that if "we had a better knowledge of customs administration we would not make the statements we do." Be that as it may, we have in connection with the framing and administration of the present cotton schedule used what knowledge we possess with the following result:

1. Congress was forced to abandon as impracticable a system of cloth duties which had been adopted by both branches twice, in 1911 and 1912, and which the House had adopted for the third time in 1913.

2. Congress was forced to adopt our method of determining the average yarn number of cotton cloth and in doing so used the identical language of our March, 1913, editorial. So far as that goes the editorial is now the law of the land.

3. The Treasury Department on Oct. 30, 1913, on information obtained from the Bu-

reau of Standards and in opposition to our advice, adopted 7 per cent. as the moisture regain. On March 9, 1914, it reversed that ruling and adopted 8 1/2 per cent., the regain we had recommended.

4. The Treasury Department on Oct. 30, 1913, on information obtained from we do not know whom, directed that cotton cloth should be conditioned for tariff purposes only when the weight was within 4 per cent. of the dividing line. We exposed the absurdity of any arbitrary limit in a letter to the Department eight days later. The Department replied on November 25, that the limit would be changed if the variations exceeded 4 per cent. On March 9, 1914, it changed the limit to 5 per cent., and we have just illustrated the absurdity of the last-named limit.

5. The Underwood cotton cloth paragraph has two material defects: The rates are adjusted to the average yarn number by a step-ladder arrangement of dividing lines instead of the uniformly progressive method. The word "excessive" was inserted when providing for the removal of sizing material before determining the yarn number. Both of these defects exist because our recommendations were not followed.

Such is the record to date.

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Mill Stocks and Consumption of Cotton

The report of cotton on hand at the mills, issued by the International Cotton Federation includes returns from mills operating 132,059,812 spindles out of a total of 144,704,012 spindles in all countries.

STOCKS AT AMERICAN MILLS

Date	Returns, Spindles.	Bales on hand.	Bales used per week.	Stocks will last
Aug. 31, '05	23,687,495	776,801	82,288	9.4 weeks
Aug. 31 '06	25,250,096	688,312	94,413	7.3 weeks
Aug. 31, '07	26,242,000	996,000	95,904	10.4 weeks
Mar. 1, '08 est.	27,000,000	1,089,119		
Aug. 31, '08	27,846,000	596,000	87,981	6.4 weeks
Mar. 1, '09	27,846,000	1,831,800		
Aug. 31, '09	27,783,000	908,000	97,788	9.3 weeks
Mar. 1, '10	28,000,000	1,674,000		
Aug. 31, '10	28,349,000	518,000	90,519	5.7 weeks
Mar. 1, '11	28,500,000	1,525,000		
Aug. 31, '11	28,872,000	523,000	90,308	5.8 weeks
Mar. 1, '12	29,522,597	1,543,000		
Aug. 31, '12	30,313,000	871,000	103,231	8.4 weeks
Mar. 1, '13	30,579,000	1,958,000		
Aug. 31, '13	31,505,000	777,000	111,269	7.0 weeks
Mar. 1, '14	31,519,766	1,726,000		

The report for mills outside of the United States is as follows:

STOCKS AT FOREIGN MILLS

Date.	Returns, Spindles.	Bales on hand.	Bales used per week.	Stocks will last
Aug. 31, '05	46,726,929	935,237	103,269	9 weeks
Mar. 1, '06	54,297,537	1,237,120		
Aug. 31, '06	66,072,303	1,210,610	145,603	8.3 weeks
Mar. 1, '07	71,054,503	1,911,071		
Aug. 31, '07	74,279,078	2,368,410	190,811	12.4 weeks
Mar. 1, '08	78,984,106	2,342,127		
Aug. 31, '08	83,371,883	2,132,045	215,472	9.9 weeks
Mar. 1, '09	85,906,697	2,425,127		
Aug. 31, '09	88,188,004	2,275,392	222,740	10.2 weeks
Mar. 1, '10	91,154,411	2,492,688		
Aug. 31, '10	91,124,025	2,005,786	236,990	8.4 weeks
Mar. 1, '11	93,726,091	2,641,688		
Aug. 31. '11	92,405,197	2,096,052	252,365	8.3 weeks
Mar. 1. '12	94,041,529	2,657,413		
Aug. 31, '12	96,424,132	2,998,540	278,142	10.8 weeks
Mar. 1, '13	92,985,126	2,811,535		
Aug. 31, '13	98,390,651	2,763,771	278,680	9.9 weeks
Mar. 1, '14	100,540,046	3,136,494		

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Merchants Association Favors the Rogers Bill

The Merchants Association of New York has been taking an active interest in "pure goods" legislation and is to be congratulated on the common sense course it has followed. Its committee on comercial law recently gave a hearing on the Lindquist, Palmer and Campbell bills. The showing was so overwhelmingly against those measures that the committee's report in opposition was adopted by the association. Not content with an attitude of opposition only, the association began a campaign of education by printing and distributing the British Merchandise Marks Act, following this up with a careful study of that measure. As a result the board of directors of the association has endorsed the bill introduced by Congressman John J. Rogers, which is based on the principle of the British act. The report of the committee on commercial law, advising this action is as follows:

This bill is based upon the principles embodied in the English "Merchandise Marks Act," and is approved by your Committee as an effective substitute for the Lindquist bill and for bills which provide great elaboration for the labeling of fabrics, articles made therefrom and certain articles of leather, in such manner as to state their constituent elements and the proportion of each, which bills this Committee has heretofore strongly disapproved as wholly impracticable.

Your Committee recommends that the Rogers bill be approved and supported by The Association, and that Section 6 be so changed as to sub-

stitute "and" for "or" in the definition of misbranding wherever it occurs, so as to read "false, inaccurate and misleading."

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The Weight of Silk Thread

The methods of marking silk thread to indicate its weight when offered for sale at retail have recently been investigated by Thure Hanson, Massachusetts Commissioner of Weights and Measures. As a result the practice of indicating the weight of silk thread and twist in "pounds" of 8 ounces, 10 ounces, or 12 ounces is to be discontinued. The Commissioner took the position that a pound is 16 ounces. Backed, as he was, by both United States and State laws to the same effect he was able to convince the manufacturers that the use of the short pounds was in violation of law, regardless of the fact that they had been sanctioned by trade custom.

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Sheep Dips in Australia

Soon after the new tariff providing for free wool became a law last October, we received a letter from a correspondent who called attention to the use of caustic soda in the sheep dip used in South Africa. This letter, which was published in our November, 1913, issue over the nom-de-plume "Chemical" warned textile manufacturers of the effect of caustic soda on the wool fiber and referred to the prospective increase in the use of South African wool in the United States under the new tariff.

Realizing that the effect of caustic soda on wool depends on the manner in which it is applied and that it might be used for the eradication of disease in sheep without injuring the wool grown on the animal, we decided to make an effort to determine the facts in order to guide the wool trade intelligently. We obtained statements from the South African Department of Agriculture, which were published in our January issue. We also requested the Department of Commerce to have the American consuls in South Africa and Australia investigate and report on the subject. This was done and we give below a report by the American consul general at Sydney, Australia, who forwards a report to him by chief inspector of the new South Wales Department of Agriculture. The inspector gives the results of analyses of various proprietary dips, one of which he states contained caustic soda. We submitted the report to the English manufacturers of the dip in question, and have received from them the following wireless message and letter:

Berkhamsted, Eng., Apr. 22, 1914.

Editor Textile World Record:

Reference your letter 14th April, Cooper's sheep dipping powder contains no caustic soda and none has ever been used in the 71 years of its manufacture.

William Cooper and Nephews,
Manufacturers and Proprietors Cooper's Dips.

Editor Textile World Record:

Dear Sir—We much appreciate the courtesy of your lines of the 14th inst., covering copy of a letter from the American Consul General, Australia, containing the results of analyses of certain sheep dips.

One of these analyses indicates that caustic soda (sodium hydrate) is an ingredient of Cooper's sheep dipping powder.

Now, caustic soda is admittedly injurious to wool, and it is, therefore, by no means a desirable application to sheep. You will, therefore, see that a statement that Cooper's sheep dipping powder contains caustic soda is very likely to prejudice users of sheep dips against this preparation.

Considering the matter of importance as being greatly misleading if left unexplained, we have today cabled you. (Message given above).

In making this very positive statement we feel that it is only fair to the analyst for us to say that it is not at all unusual for chemists when determining by analysis the amount of soda in any form in an article to express the sodium content in terms of sodium hydrate, whereas the compounds actually present might not be the hydrate at all, but some other quite distinct sodium compound—as it was in this case.

We ask your leave to repeat here, and confirm, the statement in our cablegram, i. e., Cooper's sheep dipping powder does not contain a particle of caustic soda, and that none has ever been used in the process of its manufacture at any time during the 71 years which have elapsed since its invention. Yours truly,

William Cooper & Nephews,
(Foreign Dept.)

The consular report from Sydney is as follows:

Sydney, Aust., Feb. 11, 1914.

Sir:—I have the honor, in response to the Department's instruction of Dec. 10, 1913 (File No. 165,103) to report that I have now received from the Chief Inspector of Stock of the Department of Agriculture of the State of New South Wales, a communication from which the following is extracted:

"I beg to state that the proprietary dips in more general use in this State are Cooper's, and McDougall's, and attached you will find results of analyses of three of these preparations.

"I might state that sheep dipping in this coun-

try, excepting in the case of animals imported from without the Commonwealth, is not compulsory, but at the Government Farms it has been thought of advantage to dip the sheep and for this purpose Cooper's preparation has ordinarily been used.

"The sheep in quarantine are treated with a preparation, formula for which I have given marked 4."

The analyses referred to in the Inspector's letter are as follows:

Cooper's Fluid Sheep Dip

Pyridine and pyridine bases	0.67%
Resin, resin acids and fatty acids	16.41
Phenols (carbolic, cresolic acids)	63.68
Ash	4.77
Difference chiefly water	14.57

The sample contains 62.68 per cent. phenols dissolved in a resin soap.

Cooper's Sheep Dip Powder

Total sulphur	70.29%
Arsenious oxide (As 203)	15.36
Sodium hydrate (NaOH)	6.72
Ash	0.25
Moisture and undetermined	7.38

Macdougall's Non-Poisonous Sheep Dip

Light tar oils and napthalene	17.83%
Heavy tar oils	66.14
Pyridine	0.70
Phenol	5.46
Fatty and resin acids	1.94
Sodium carbonate	5.14
Residue insoluble both in ether and dilute sulphuric acid	1.53
Undetermined resinous matters	1.26

Imported sheep in quarantine are dipped on at least two occasions (with an interval of not more than fourteen days) by thorough immersion in an approved solution of lime and sulphur, at a temperature of 110° F., and prepared in the proportions of 4 ozs. of flowers of sulphur and 2 ozs. of lime to one gallon of water. John P. Bray,
American Consul-General.

We have also received reports from Hobart, Tasmania, Melbourne, Australia and Durban, South Africa, which are in part as follows:

Consul George W. Hanson, Hobart, Tasmania: "The use of a regulation sheep dip in the Commonwealth of Australia, including Tasmania, is required only in reference to imported sheep. The Act provides:

> 'All over-sea sheep and goats are subjected to 30 days' quarantine, and have to be dipped on at least two occasions (within an interval of not more than 14 days) by a thorough immersion in an approved solution of lime and sulphur at a temperature of 110° F. and prepared in the proportion of 4 ounces of flowers of sulphur and 2 ounces of lime to one gallon of water.'

"The eradication of disease and vermin among local sheep is a matter that rests with the various States with the result that in the six subdivisions of the Commonwealth the regulations differ widely. In the State of Tasmania the law provides that all sheep must be dipped within twenty-eight days of shearing, all lamps being dipped at the same time. The law, however, is silent as to what the sheep shall be dipped in.

"Sheep men say that all dips are mixtures of sulphur, lime, nicotine and arsenic, but, as the manufacturers of proprietary brands do not choose to give the formulas of manufacture or the proportion of the ingredients used, this information cannot be obtained."

Consul William C. Chapman, Melbourne, Australia:

"With reference to Department's unnumbered instruction (file No. 165,103), dated December 10 last, transmitting copy of letter from the editor of 'The Textile World Record,' requesting information concerning sheep dips used in Australia, I beg to inform you that this matter was referred to the editor of 'The Pastoral Review,' the leading wool and produce paper of the Southern Hemisphere, and I have now been favored with his report, as per enclosed copy."

The Pastoral Review: "First, as to poisonous preparations. On the big Australian and New Zealand stations the cost and trouble of mustering sheep are no light matters, so that owners naturally wish to get all the benefits that are to be derived from effective dipping, and protection from re-infection is one of the special features of the leading proprietary poisonous sheep dips. The poisonous dips are mostly in the form of powder or fluid, rarely in the form of paste. Casualties in the use of these poisonous preparations are of very rare occurrence and they arise almost entirely from careless handling, in fact they occur no more frequently than is the case with non-poisonous preparations. Non-poisonous sheep dips are all in the form of carbolic preparations. In regard to your inquiry as to whether Australian Governments give official approval of any sheep dipping compositions, I do not know of any instance where that is so, but in Victoria and parts of South Australia sheep dipping is made compulsory, and the same is the case in New Zealand. Where compulsory dipping is in force sheep owners are given a free hand as to the choice of dips, their only responsibility being to keep their flocks clean.

"Though none of the Australian Government endorse the use of any particular dip, the majority of the leading officials of the various stock departments advocate the use of manufactured poisonous dips of repute in preference to non-poisonous preparations. Australian Governments have recognized the wisdom of leaving such matters as the selection of sheep dips to the wool growers themselves. Manufactured sheep dips are allowed into the country duty free. They are looked upon as being safe, effective and economical, and I am on perfectly sure ground when stating that, viewing the Commonwealth and New Zealand generally, crude preparations such as lime and sulphur, tobacco, etc., would not be tolerated by wool growers in these countries."

Vice-Consul Hugh S. Hood, Durban, Natal, Africa:

"In a communication received from the Secretary of Agriculture, Union of South Africa, dated Jan. 30, 1914, on the subject, that official states:

"'The whole question of the effect of dips on wool is receiving the careful attention of this Department and experiments are being conducted at the present time which will enable this Government to speak with authority regarding the merits of the recent wool controversy.'"

(This report is accompanied by a number of documents dealing with South African sheep dips, and which are in line with the information we have already published.)

THE WOOL GOODS MARKET

New York, April 30, 1914.

General quietness has settled over the wool goods market, the first order business being practically over and the sample pieces having been delivered. The clothing salesmen are on the road with their full lines of clothing for next fall and winter consumption. It is a time for anxious "watchful waiting" for the sellers of all kinds of woolens.

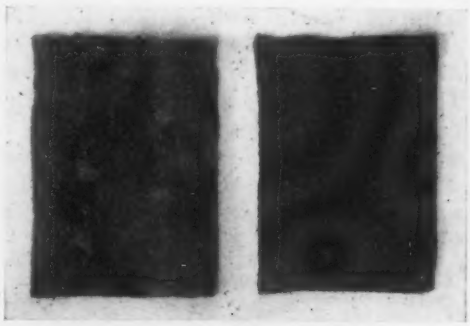
The jobbers of clothing have made their first trips and have placed their first duplicate orders for piece goods, indicating that the styles ordered are the successful sellers in clothing. Those not already having received orders from that trade may as well decide that their fabrics and styles are not what the trade demand, and they need not longer look for orders from clothing jobbers.

The regular clothiers report that the cool weather of the month has been detrimental to the retail trade. The discharge of many thousand employes by the railroads and other companies in various branches of business, and the uncertainties regarding the complications with Mexico, are no doubt having an adverse influence on the trade, which may account for the unsatisfactory business reported by a large number of retail clothiers.

A number of the larger clothiers claim that they are having a satisfactory business and there are probably a few that are selling their usual quantity of merchandise. They, however, are decidedly in the minority. Suits have sold far more freely than have overcoats. The uncertainty as to what style of overcoat will be in demand has prevented their sale, to a very large extent.

The orders for piece goods to cover the clothier's sales of clothing have begun to come in and have created some bright spots among the fortunate selling agents. It is predicted that there will be trouble with some fabrics which have been made too light in weight for winter wear. Some business has been done on 13 and 14 ounce goods and the clothing made from them is none too heavy for summer wear and they doubtless will prove totally unfit for winter wear.

Many worsted mills have had an excellent business on various fabrics. Fancy worsteds



NO. 2 AN IMPORTED CLOAKING NO. 5 A WORSTED SUITING

have received a good portion of the sales and a number of mills have sufficient business booked to keep them under full operation for practically all the season. On the other hand there are some mills that would welcome new business to piece out the season.

Carded wool fabrics have generally not met with much success in securing sufficient business to bring encouragement. There are, however, a few mills that have been more favored and have met with liberal orders, either for suitings or overcoatings of a fancy nature, such as fabrics suitable for balmacaan or mackinaw coats. Chinchillas have done fairly well.

The duplicate order business for dress and suit goods have begun to come in from the trade. Certain mills are receiving very encouraging orders. Fabrics and styles which have proved to be satisfactory are selling well in the various markets. In worsteds the most successful fabrics seem to be ripples, poplins and cheviots, which have met with quite satisfactory orders. Gabardines have done well.

In wool carded fabrics the leading sellers have been zibelines and broad cloths. This last mentioned fabric has had a particularly free sale, especially in the medium and better grades. The fabric is doubtless having the largest sale it has had for several years. The foreign mills have secured considerable of this business.

In women's coatings coarse yarn and big nubbed effects have been in liberal demand, as they are adapted to the style of garments which are much sought for. Some of these goods are made here and the foreign manufacturers, having had considerable experience making such effects, are more than likely to get a large share of the business. There is also a good demand for checks both large and small which have had a long run and seem to hold their popularity. Thibets, which have not been much in demand for some time, have taken a new start and considerable business is being done on the fabric.

Mills making successful lines of carded wool fabrics for cloth hats and caps are getting considerable business on their various lines, which is a fair indication that the cloth hat and cap business is in a satisfactory condition.

The business done with the tailors to the trade has been very satisfactory, the orders having been placed quite freely in good quantities.

We are having an unusual run on fancy styles and colors, especially in wool carded fabrics. They are the rage throughout the various trades for both men and women. It seems impossible to get the colors too bright or the plaids too large for women's coats.

The foreign manufacturers made many mistakes in getting out styles and fabrics for the present season. They made fabrics too heavy and styles and colors too plain. It is quite probable that they will profit by their experience and get out something next season more in keeping with the demands of our various trades. They can surely compete with our mills with the present tariff of 35 per cent. under which they are now working.

The importations of woolens and worsteds this season show very large increases and next season they doubtless will be much larger.

The uncertainties of manufacturing woolens and worsteds has been demonstrated by the fact that some successes have been made principally an account of unusually desirable lines of colors which have taken with the trade and largely outsold other fully as desirable and better known fabrics.

Advances in prices are being made from day to day and about every fabric has been advanced from 7 1/2 to 10 cents per yard. That covers only the advances in raw stock of various kinds.

The lower prices made for piece goods in consequence of the new tariff do not seem to have reduced the merchant tailors' prices for men's suits. The writer has done some shopping among the tailors and was asked the same prices that have prevailed for years.

Velour finished fabrics have recently come into favor and seem to have met with some success. They, however, have not heretofore given satisfaction to the wearer, as the soft wool wears off in places most exposed to chafing. It is not probable that the finish will long remain in favor.

As usual the pirates of successful styles and fabrics are at work. They make failures of their own business and live on other more successful agents or manufacturers. They often ruin a line of goods both for the original lines as well as their own.

An analysis of four samples accompanying the above report of the wool goods market resulted as follows:

2. Wool cloaking, 20 ozs., 55-56 in., $1.12 1/2 net. Warp, 7 1/2 ends, 2 ply 1 1/2 runs woolen, 6.7 ends fancy 3 ply yarn. Filling, 6.7 picks, 2 ply 1 1/4 runs carded woolen, 7.2 picks, 3 ply fancy yarn. Actual weight, 18.2 ozs., 55 in.

3. Plain wool cheviot cloaking, 19 ozs., 54 in., 72 1/2 cents net. Warp, 24 ends, 1 1/4 runs. Filling, 20 picks, 1 run. Actual weight, 20 ozs., 54 in.

4. Worsted suiting, 15 ozs., 54 in., $1.85 net. Warp, 59 ends, 2/28s worsted. Filling, 54 picks, 2/26s worsted. Actual weight, 12.8 ozs.

5. Worsted suiting, 16 to 18 ozs., 56 in., $2.22 1/2 net. Warp, 61 ends, 2/23s worsted. Filling, 52 picks, 2/25s worsted. Actual weight, 15.1 ozs., 56 in.

The Annual Convention of the American Cotton Manufacturers Association

The eighteenth annual convention of the American Cotton Manufacturers Association was held at the Waldorf-Astoria Hotel in New York City on April 27th and 28th.

This is the first meeting this association has held in New York and those who might have been skeptical as to its success must certainly have been convinced by the number of the manufacturers attending and by the great interest in the proceedings which attracted so many members and guests to the meeting hall.

It was a business meeting from start to finish and the subjects discussed were of live and vital importance to the business interests of the cotton manufacturing industry, viz., the buying, handling, carrying and selling of cotton and these took definite shape in the discussion of the Duke Warehouse Plan, Reforms and New Rules of the New York Cotton Exchange and the Possibilities of the Extension of the Export Trade.

T. I. HICKMAN, ELECTED PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS ASSOCIATION

The warehouse plan was announced as the main topic for discussion at the banquet on

Tuesday evening, and although many of the speeches covered a wider range and the details of the plan were not gone into at great length, the speakers, including not only those representing the manufacturers' point of view, but the banking interests as well, gave their approval to the general idea. It is expected that cotton manufacturers will be greatly assisted in the financing of their purchases of cotton and that a wide market at

STUART W. CRAMER, RETIRING PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS ASSOCIATION

low rates of interest will be given to accepted commercial drafts with these certificates as collateral.

Although the first session of the convention was not scheduled until Monday afternoon, the manufacturers were registering in considerable numbers during the morning and when the convention was called to order in the ball room of the hotel at two o'clock several hundred faced President Cramer and were welcomed on behalf of the City of New York by George McAneny, President of the Board of Aldermen. There was a brief response by T. H. Rennie of Pell City, Ala., and then President Cramer delivered his annual address which is printed elsewhere. The President's gold medal was presented to Mr. Cramer and acknowledged gracefully.

A lively discussion accompanied and followed the address by N. A. Cobb of the United States Department of Agriculture, which has been conducting elaborate spinning tests of different government standard grades of cotton. It will be remembered that last year Congress appropriated $10,000 for the testing of the spinning qualities and tensile strength of the various new grades with a view of determining the real intrinsic value of different grades to a manufacturer. Dr. Cobb described in detail the manner in which the department's investigations are conducted. There was considerable criticism of the methods employed by the government experts by a number of manufacturers present and particularly of the bad effect of misleading or incomplete data. Lewis W.

Parker claimed that the government expert work did not recognize the vitally important features of "character and body of cotton," but have merely taken into consideration the length and grade of the staple. One surprising result of the inquiry was in the comparative breaking strength of the yarn spun from the different grades particularly after bleaching. The department found that, as a rule, the breaking strength of the yarn increases with the grade, but in some cases there was a surprising variation from this general tendency. He cited the example of finding the breaking strength of low middling 61.4 lbs., while the breaking strength of middling was only 60.5 lbs. There was considerable skepticism expressed by the manufacturers as to the value of these tests and indeed Mr. Parker believed that the conclusions were so misleading as to give an entirely wrong impression and might cause a great deal of harm by leading the farmers to think that good or even better yarn could be obtained from the low grades than from the higher grades of cotton. He said that the strong desire of the manufacturer was always for a crop that contained the largest proportion of high grade cotton, and if the farmer were given the impression that the manufacturer could get equally good results and possibly stronger yarn from the lower grades, there would be no incentive for him to raise better cotton, and furthermore he would feel that the difference in price was unwarranted. Dr. Cobb gave his explanation of the cause of these unexpected results of breaking strength, attributing it to the fact that the test did not include a large enough quantity of cotton to be conclusively representative of the entire grade. The Agricultural Department proposes to continue its spinning experiments and invites suggestions from the men in the trade as to the line of inquiry it should pursue. Dr. Cobb's paper was not printed in time for distribution at the meeting, but may be obtained later upon application to the secretary of the association.

Ralph M. Odell, special agent of the Department of Commerce, followed with a report on the cotton goods export trade. In connection with this paper Mr. Odell had arranged on one side of the convention hall a special display of samples of cotton fabrics collected by him showing the different classes of goods used in the foreign countries, their construction, prices and other information of interest to the practical manufacturer. These samples were also exhibited at the Boston meeting where Mr. Odell repeated his address. He takes an optimistic view of the future of the cotton export trade, pointing out that during the year 1913 our total exports have doubled in value, although only reaching at the present time to a very small fraction of that of some of our foreign competitors. Mr. Odell believes that there are enormous possibilities for further expansion of our trade abroad if we will seriously go after it in the right way.

On Monday evening the members and their guests gathered in the ball room of the hotel which had been transformed into a banquet hall. The floor was entirely filled with small tables seating from six to nine, being arranged so that groups of friends or business associates might sit together. Mr. Vanderlip's speech was the main feature of the evening, but the other speakers were interesting and there were no dragging moments. Other speakers at the banquet included Stuart W. Cramer, who presided with ability; Thomas P. Beal, President of the Second National Bank of Boston; John M. Miller, Vice-President of the First National Bank of Richmond, Va.; William A. Law, Vice-President of the First National Bank of Philadelphia; W. S. Lee, General Manager of the Southern Power Co.; and Lewis W. Parker, who explained the Duke Warehouse Plan.

Tuesday morning a discussion of the New Rules of the New York Cotton Exchange was the principal feature. Arthur R. Marsh, President of the Exchange, outlined the history and developments of the present system of grades and contract. Mr. Marsh's remarks were extemporaneous. He reviewed the history of the New York Cotton Exchange and the evolution of the present rules, contracts and grades. He denied the charge that the Exchange was opposed to reforms and stated that its history had been one of accommodation to meet the changing demands of the South. The difficulty in his

opinion was to find just what the South wanted. In this present agitation there was great diversity of opinion and it seemed wisest to the Exchange to accept the views which had finally crystalized into proposed legislation in Washington as the best expression of Southern sentiment. The Exchange has accepted the United States standard grades as the basis of contracts and beginning with May these will be the standards on new contract deliveries. Other changes were explained by Mr. Marsh. He sounded the note of warning against too close regulation for business by the government and feared that, if the present tendency were continued without check, it would not be long before fundamental conditions would be so arbitrarily tied up by legislation as to seriously hamper the free conduct of business by manufacturers and merchants as well as farmers.

Following Mr. Marsh's address came the report of Lewis W. Parker, Chairman of Committee on Cotton Exchanges. The report of the committee was amended so as to recommend consideration of a plan whereby the delivery of cotton on New York Cotton Exchange contracts might be made from warehouses in the South under suitable provision, quite possibly in connection with the proposed Duke Warehouse Plan.

A. M. Patterson, director of the new Textile Alliance, which has recently been formed by delegates from four different textile associations for the suppression of fraud and improper practices in the purchase of mill supplies, made a brief presentation of the intended scope of the organization (published recently in this journal) and cited some instances of what had already been accomplished, inviting not only the cooperation of the association as a whole, but also that of the individual members in carrying out the work.

John P. Wood, director of the recently incorporated Textile Bureau, made a brief statement showing what was hoped to be accomplished by this bureau, which is endorsed by the different textile associations for the purpose of preventing undervaluations on imported textile goods resulting in loss to the government and unfair competition to the American manufacturer, and also to secure proper classification and aid the appraisers in determining real values and the trade interpretation of trade descriptions. It is further proposed that the bureau shall eventually recommend such changes in the technical drafting of tariff bills as may suggest themselves from practical experience with the view of more fully carrying out the intent of the acts in their application to different fabrics so as to prevent technical evasion of intended duties. Mr. Wood spoke later in the week on the same subject before the Boston meeting and his remarks will be found in that report.

Various reports of committees were submitted and the election of officers brought the convention to a close. The new officers elected were as follows: President, T. I. Hickman, President and Treasurer of the Graniteville Mfg. Co., Augusta, Ga.; Vice-President, Scott Maxwell, Agent for the Indian Head Mills, Cordova, Ala.; John A. Law, President and Treasurer of the Saxon Mills, Spartanburg, S. C., was elected Chairman of the Board of Governors; C. B. Bryant, Charlotte, was again elected Secretary and Treasurer. The following new directors were added to the board to fill vacancies: Leroy Springs, J. W. Cannon, A. W. McLellan.

Mr. Cramer received many deserved congratulations on the success of the convention, to which his ability as a presiding officer at its business sessions and the banquet so largely contributed. He kept things moving and a great amount of business was transacted in the two short sessions which otherwise would not have been possible.

Not only in connection with this meeting, but during the entire year he has devoted a large amount of time and energy to the work of the association and retires from office with the appreciation of his faithful service from his fellow members. Secretary Bryant has, by long experience and natural aptitude for the duties of his office, become so proficient in handling the work of a large convention that everything goes smoothly without apparent effort, which is the best tribute to thorough preparation and good executive management.

PRESIDENT CRAMER'S ADDRESS

Fellow Members of the Association:

It gives me great pleasure to greet you at this, our Eighteenth, Annual Convention.

It is also my valued privilege to extend to guests present our greetings and most hearty welcome.

The history of our organization is following closely that of other like trade guilds and associations, the world over and from time immemorial, beginning with gatherings largely social in their nature by which men in a competitive business became acquainted with each other and gradually awakened to a sense of community of interest; then following, an increasing freedom and willingness in the exchange of ideas and information, particularly on trade and technical subjects; resulting ultimately in a complete appreciation and realization of the strength of organization and co-operative effort. Those engaged in every successful industry in every country and, indeed, in every civilization, sooner or later, have felt and yielded to the need of united effort.

The whole world, today more than ever, is studying this inevitable evolution of commerce and industry. Nations approach the problem from different viewpoints; some encourage cooperation even to the extent of adding to its paternalism; all recognize and accept it in one form or another for it is the will of the people. Germany has developed an elaborate educational system for teaching the true relation and value of individual cooperation in economics; has fostered it and aided by state cooperation until she is the most feared rival in foreign commerce. Japan is equally awake and only less advanced because of lack of means.

Broadly speaking, both consolidation and cooperation develop and appear under pressure of unreasonable competition or over production; hence, some industries have progressed farther along those lines than others. It is only comparatively recently that the cotton manufacturing industry in the United States has been brought face to face with conditions demanding such radical readjustments in its business methods; having been possessed of the greatest home market the world has ever seen, with a supply only approximating the demand, with competition largely domestic only, the individual units acting independently have greatly developed and prospered.

Without consuming your time by sketching more than the barest outline of this thought, I wish to emphasize to you that while this industry is still free from consolidations approaching monopolies and even of healthful cooperative organization beyond the advisory stage, that both economic and political developments have brought us to a point where steps must be taken towards more actual and real cooperation. With the mistakes of others clearly before us and with careful and prudent counsel, we can so proceed as not only to maintain but to exceed the splendid record of our past, and all within both the letter and spirit of the Law. By following sound principles and effecting legitimate economies each can conserve his own business and add to the prosperity of all others concerned—the producer of the raw material, the manufacturer, the merchant and the consumer. Economies must be effected in buying and handling raw materials, in processes of manufacture and in the distribution of the product; lost motion and waste at every step must be reduced to a minimum.

Periods such as we have been passing through are hard and wearing, but the process is a natural one. It is a well known principle of biology that "A live thing is distinguished from a dead thing by the multiplicity of the changes at any moment taking place in it." It is certainly reassuring that we must be very much alive, indeed, at this time if the changes in the conditions of our business during the past few years indicate anything; we seem to have had everything except increases in the prices for our product.

In taking stock of the situation and considering where to begin, it so happens that the natural beginning of addressing ourselves to the problem of raw materials is the one the successful solution of which will result not only in much direct gain but probably also will constitute our greatest step toward economic independence.

Many manufacturers have given much thought and study to this question and have foreseen and followed to a considerable extent the general form and direction of a successful answer, but the shadow of economic dependence has always obscured the path of definite and complete accomplishment.

And so, I have taken the liberty of departing from our custom of presenting for your attention a variety of papers largely technical, and beg to direct your thoughts during this convention exclusively to the more fundamental problems affecting the cotton manufacturing industry; and, particularly do I ask your consideration of the subject of reforms in the buying, handling and carrying of cotton.

A discussion of that question naturally deals, first, with the rules and conditions under which cotton is bought and sold; and, second, with financing both the commodity and the mercantile transaction. As will be shown by speakers who will address you and by the report of your committee on cotton exchanges, movements are already well under way indicating a great improvement in, if not altogether a completely satisfactory adjustment of conditions governing the first phase of the question, viz: the rules for buying and selling cotton.

There will also be submitted a plan that seems perfectly feasible for successfully disposing of the other and equally difficult matter of financing cottop transactions. This is more or less familiar to most of you as the Duke Warehouse plan; it will be explained in the report of the special organization committee, and discussed by speakers at our banquet.

In view of the fact that the manufacture of cotton is an industry more than one hundred years old, that it is a very large one spread over the entire civilized world, that the evolution of its technical processes has been the achievement of very many trained minds both practically and scientifically educated, it appears extremely un-

likely that radical changes or improvements in processes of manufacture are to be expected. The greatest opportunities along this line seem to lie in acquiring greater skill in the use of inferior cottons to produce a given result, in diminishing the amount of waste made and in the utilization and working up of waste.

The standardization of sales notes, the adoption of standards of moisture or regain, the correction of some well known trade abuses in the sale of dyestuffs and certain supplies, an organized and well administered bureau for guarding against customs-undervaluations of imports, are all matters of extreme importance and are making satisfactory progress in the hands of standing committees.

Although the new Tariff Act has been passed and has been in actual operation for some time, the work of your Tariff and Legislative Committee is by no means ended, for it is naturally to be expected that there are uneven places in the measure that will require smoothing out, the pointing out of which will undoubtedly be left to manufacturers. It is by no means believed that the amount of importations form a conclusive method of judging the effect of the new tariff bill upon the cotton industry. Up to the present time, the effect has been largely one of the pressure of threatened importations, domestic manufacturers meeting prices and holding the business at figures that are profitless in many instances. As was frequently prophesied during the tariff hearings and at the time the bill was under consideration, in few if any of the cases where the already small profits to the manufacturers have been squeezed out has the ultimate consumer been the gainer; such reductions have been absorbed in the cost of distribution. As a whole, the manufacturers of the country have loyally supported the Administration in the trial of its new tariff measure in the hope that an analysis of is workings will lead to corrective legislation where required, to the benefit of the producer and still without detriment to the consumer.

Further study of foreign markets and more cooperative and organized effort in that direction seems to be the solution of the export problem. The greatest successes yet achieved in American exportations appear to have been in the case of patented specialties, the products of highly organized and comparatively new industries, and particularly of industries with large corporations having powerful financial resources enabling them to maintain foreign offices and warehouses and to extend the necessary lines of credit. It is hoped that the new Currency and Banking Act will not only provide elasticity enough to prevent money panics but that its feature of foreign branch banks will work out to be of substantial help in developing our export business.

During the past year, many English mills and merchants have quietly been making trade connections in America with a view to that outlet for surplus goods when needed; there are abundant indications that this condition is arriving, for advices from Lancashire indicate that new business is slow and that the present shipments of cotton goods are largely on orders taken some time ago. With a downward price tendency and a weak demand over there, we can expect a corresponding increase in importations at an early date.

The many kinds of legislation recently passed and pending, both constructive and destructive, undoubtedly contribute largely to the present unsatisfactory condition of business; it is difficult to see how much actual improvement can be expected until the uncertainty continually engendered in this manner is removed.

Prosperity seldom smiles on one industry at the expense of another; the general welfare of the whole country is so closely knit that a blow at any one constituent part is felt all down the line. Whether an individual railroad is wrecked by its management or whether the whole railroad system of the country is shaken by federal or state persecution, is only a matter of degree; all industry feels the shock. Whether one community is terrorized by the I. W. W. or whether a whole industry is paralyzed by unreasonable and restrictive legislation, is again only a matter of degree; the general business of the country feels the demoralizing effect.

The truth is that the welfare and happiness of practically all the people in this country are dependent upon the general condition of business. The stock in our railroads, banks, factories, mines and utilities are largely in the hands of relatively small investors; their other securities are largely held as investments by insurance companies, trust companies, savings banks and other repositories for provision of the masses against want and privation in their time of need. The "people" in such cases are not merely the work people engaged therein, nor the consumers only, but the whole people comprising farmers, merchants, manufacturers, clerks, salesmen and saleswomen, mechanics, laborers, servants, widows, orphans, and all who are dependent, in every walk of life.

In their mad race for progressiveness some of our political friends seem to have become imbued with the intolerant and snobbish spirit of the English official and aristocratic class portrayed by Tennyson in his lines:

> "We are not cotton-spinners all,
> But some love England and her honor
> Yet."

The duty of guarding the rights of the people entails the far heavier responsibility of conserving the welfare of the people. For example, denying the right of self-support to a dependent child should entail some other provision for its need; refusing work to able-bodied children should carry with it compulsory education to prevent their idleness from breeding degeneracy; restricting women's work should not be without other opportunity of a livelihood for themselves and children dependent upon them; a minimum wage, particularly in industries employing unskilled women where there is great competition for places, puts a premium on immorality for the slower and duller ones.

In spite of the agitation and misrepresentation of the few whose occupation is chiefly in so doing, the cotton manufacturers are doing a great work in improving the condition of work people, pro-

viding them with better homes and often with work rooms whose sanitary conditions challenge equality in even the public buildings and schools of the most progressive parts of our country. As a rule, these men are quietly solving their problems without noise and personal advertisement; they meet practical legislative betterment in a spirit of cooperation but always without losing sight of the responsibilities that go with it—as when the manufacturers in the state of North Carolina insisted upon compulsory education accompanying the recent raising of the age limit for child labor.

Conditions in the United States vary greatly in different parts of its immense domain and oftentimes blanket legislation that will be a help in one section may prove a hinderance in another. The development of children, both mentally and physically, varies greatly from the extreme North to the extreme South; state legislation affecting age limits and hours of labor is, therefore, both to be preferred and is more rational than federal regulation.

In conclusion, I beg to repeat that it is my firm conviction that cotton manufacturers must relieve themselves of the burden of financing their yearly supply of cotton, or it will be a long time before the industry achieves that degree of economic independence necessary for unhampered movement towards the solution of its other problems.

COTTON GOODS EXPORT TRADE

BY RALPH M. ODELL

Commercial Agent, United States Department of Commerce, Washington

There is unquestionably a sound reason for an optimistic view of the future of American cotton goods export trade. During the calendar year 1913 the total exports of all kinds of cotton manufactures from the United States amounted in value to over $55,000,000, or more than double the exports in the year 1908. The loss of a considerable trade in China in the years immediately following 1905 and 1906 was very seriously felt by our mills, but the opening up of the market in the Philippines following a readjustment of the tariff providing for the free entry of American goods enabled us to recover a large part of this loss and it is worthy of note that during the past six years our exports of piece goods have steadily grown, amounting in value to over $32,000,000 in the calendar year 1913 as compared with only $17,000,000 in 1908, an increase of 90 per cent. It is a fact that is perhaps not generally known that no other country in the world, with the possible exception of Japan, has equalled this record of progress. My investigations of foreign markets during the past few years, under the direction of the Department of Commerce, have led to the firm conviction that there are enormous possibilities for a further expansion of this trade if we will seriously set ourselves to the task and widen the range of fabrics which we offer to the foreign buyer in accordance with the requirements and conditions of the markets.

As many of the members of this Association are aware, I have only recently returned from a visit to the Levant, Red Sea district, East Africa and South Africa, where, during a period of eighteen months I had the opportunity of observing at first hand the conditions prevailing in those markets and the possibilities which they offer for the sale of American cotton goods. The Red Sea and East Africa have been for years one of the principal outlets for American gray goods and during the year 1913 we exported to those markets nearly 40,000,000 yards of this class of cotton manufactures out of our total exports of piece goods to the amount of 213,000,000 yards. Nearly 20 per cent. of our exports of gray goods, therefore, find their way to these districts. In Arabia, Abyssinia, British and German East Africa and Uganda we furnish more gray cloth than all other countries combined. The extent to which we

RALPH M ODELL

dominate the trade in this class of goods is evidenced by the fact that "Americani" is the word used by most of the natives to designate unbleached sheetings from whatever country they may come.

The success of our efforts and the rapid growth of our trade in the Red Sea district and East Africa is a striking indication of the possibilities which the foreign field offers as an outlet for the production of our mills, a production which it cannot be denied is constantly exceeding the requirements of the domestic market. Our Red Sea trade suffered a decline last year because of the activities of Austrian manufacturers who, finding the demand in the Balkan States greatly curtailed owing to the war, offered their goods at low prices in Aden in order to keep their mills running. This was a temporary condition, however, and we may

expect to see our exports to the Red Sea market revive during the present year. In East Africa we have also found a splendid outlet for our cotton goods and our trade there has more than doubled in the past five years. Throughout these markets our brands are well established and I usually found that the natives preferred American gray goods to all others. It appears to be a market based on quality rather than price and the superiority of the fabrics we offer has been largely responsible for our success in securing over 50 per cent. of the gray goods trade. Italian manufacturers are at present making a strong bid for a larger share of the trade by improving the quality of their goods, which were formerly too heavily sized to suit the native taste, establishing selling agencies in the interior and by providing direct transportation facilities. The imports of Italian gray goods into British East Africa increased in value from $64,000 in 1912 to $211,000 in 1913.

The market is well worth the serious attention of American manufacturers because the steady development of the resources of East Africa, the progress which the natives are making toward civilization and the building of railways to sections that have heretofore been lacking in means of transportation for carrying the products of the country to the seaboard and for the distribution of goods imported from abroad is causing a rapid commercial expansion and cotton goods constitutes the largest single item in the trade. It is also a significant fact that the consumption of bleached and colored goods is growing rapidly, particularly in the more settled areas, and if we expect to continue to be a factor in the trade of the country we must set about to broaden the line of goods which we can supply and not confine ourselves to gray goods alone.

In addition to furnishing lines of goods which we do not now supply, there are three suggestions which may be made for maintaining and increasing our trade in East Africa. First, we must keep pace with the progress of the country by providing means for introducing our goods in the interior districts where the natives are just beginning to buy cotton goods in appreciable quantities. The Italians and Germans are in the forefront of the commercial development that is taking place in Africa, and this accounts in a large measure for the increasing share of the trade which they have been able to secure. Second, we must improve our methods of packing and marking our bales which go to these markets. I frequently observed bales of American cotton goods being unloaded from steamers in the ports on which the burlap ends were torn almost entirely off, the binding ropes broken and the identification marks indistinct and blurred. Our goods are subjected to considerable handling before they reach East Africa because they must be transshipped once and sometimes twice en route. Moreover there are no piers in East African ports and the bales must be transferred from the steamers to small boats often in a very hurried and careless manner. Italian, German and English cotton goods are more securely packed and arrive in much better condition than those from our country. I noticed that the Germans use broad iron bands, painted to prevent rust, for strapping on their bales instead of ropes and large letters and figures for identification. In the third place, it is highly important in these far away markets that we maintain the quality of our goods. The importers and dealers who have been buying a certain brand of cloth for many years require that the quality be the same at all times, and I am glad to report that I heard very few criticisms on this score.

South Africa, where I spent several months, is a very interesting and important field for the development of our cotton goods trade, but it is a market to which we have heretofore given scant attention. The imports of all kinds of cotton manufactures, including apparel which is mainly made of cotton, amount to over $30,000,000 a year, of which we supply less than $500,000. Of piece goods imported to the value of eight and a half million dollars we furnish less than $100,000. The kinds of goods sold in South Africa are different from those in demand in East Africa. Gray goods are not much in demand and the most important lines of piece goods sold are shirting prints, solid color goods, such as cotton flannelets, Turkey red calico, denims, blue drills, cashmerettes, sateens and colored nainsook; bleached goods and woven colored goods consisting mainly of Oxford shirtings, zephyrs, ginghams, striped drills and fancy dress goods. The most important line is prints and there is every reason to believe that American prints could be successfully introduced if they conformed in width and finish to those in demand. The principal widths are 28, 30 and 32 inches and England, Germany and Italy supply the bulk of the goods sold. The rapid development of South Africa is causing a considerable expansion in the trade and the use of cotton goods among the 7,000,000 natives in the country is increasing year by year. There are a number of large, well-established firms in the country who might be induced to handle American cotton goods if they were properly brought to their attention. There is a 3 per cent. preference in the tariff in favor of England, but in spite of this European countries have captured 20 per cent. of the cotton goods trade. In the total trade of South Africa the United States ranks after England, our annual sales being valued at nearly $16,000,000. The freight rates from New York to South African ports are practically the same as the rates from England and Europe. The success of Germany and Italy in the cotton goods trade has been due to the fact that the manufacturers in those countries send out numerous travelers once or twice a year, they secure capable resident agents, get up a large number of attractive samples not only for their own travelers but for the use of the importer or wholesaler in selling to the retail trade, they extend two to four months credit and provide every facility for carrying on the trade. In all of my travels during the past three years in the markets of Europe, the Levant and Africa I never met but two American salesmen who were selling cotton goods, while I was constantly encountering the representatives of English and Continental cotton goods firms who were showing their samples and securing orders. The question which the importers frequently asked

me was: "How can we buy American cotton goods?" There seems to be a general ignorance abroad regarding the kinds of goods we are able to furnish and the proper manner in which to purchase them. Trade in all lines has a tendency to follow the line of least resistance and it is only natural that our competitors, who send out their own salesmen or have their resident agents on the ground, should secure the bulk of the trade. We cannot hope to compete successfully with these methods until we make the selling of goods to our foreign buyer a permanent part of our business, instead of attempting to interest him by long distance correspondence. My investigations of the cotton goods markets abroad during the past three years have led to the firm conviction that the expansion of our export trade is more dependent on serious, intelligent, and organized methods of selling and distribution than on any other one factor. Many of the lines which we now make could, with very slight changes in construction or finish, be sold in certain foreign countries if we would apply the same amount of effort which we use in the domestic field. Other lines which we do not manufacture, but which are consumed in large quantities abroad, could be made at competitive prices if we would devote our energies to the task. Foreign trade is not a matter that can be hurried, it requires a serious study of the requirements of the people, an earnest determination to cater to those requirements of the inauguration of a well organized selling system. In markets where our goods are almost, if not entirely, unknown we must be content in the beginning to accept small orders and to grant the same concessions as our competitors in matters of credit, and the width, design, finish and packing of the cloth. The trade in Africa, as in many other parts of the world, particularly in agricultural countries, is on a credit basis. The general custom is two to four months and our sales of cotton goods are bound to be restricted as long as we are unable or unwilling to grant similar terms. It is not difficult in these days to ascertain the financial standing of an importer in any part of the world and I have found reliable houses in every country that I have visited.

The world's trade in cotton manufactures amounts to the huge sum of approximately $1,200,000,000 annually. The United States, which has 22 per cent. of the spindles and supplies two-thirds of the raw material, has less than 5 per cent. of this trade. The most important markets for cotton goods are India, China, Turkey, the Levant, South America and Africa. American cotton goods go mainly to Canada, the Philippines, China, the West Indies, South America, India, the Red Sea district and East Africa. The markets in Turkey, Egypt and South Africa have hardly been touched by us, while our share in the enormous trade of India and South America is not nearly as large as it should be. Africa, with a population of 170,000,000, or more than that of North and South America combined, promises to be one of the largest markets for cotton goods in the world. The fact that there is no cotton industry on the entire Continent, that climatic conditions make cotton the principal material for clothing, that the rich natural resources of the country are gradually being developed, thus enhancing the purchasing power of the natives, and that the rapid building of railways is providing transportation facilities to the interior make it a field well worth the attention of American cotton manufacturers.

The situation of the American cotton industry as regards the export trade is one that calls for a cooperative and well organized campaign rather than half-hearted and spasmodic attempts to sell to the foreign buyer. If a number of cotton goods manufacturers or exporters would combine to thoroughly canvass the important markets of the world, our trade would undoubtedly increase, and instead of selling a few goods here and there we would have a steady flow of exports that would grow with the prosperity of the foreign countries and would be less effected by violent fluctuations than our home trade. Our attitude of regarding the markets abroad as a dumping ground for goods which we cannot sell at home, is slowly but steadily undergoing a transformation as we begin more and more to face the fact that the production of our mills exceeds a consumptive capacity of the domestic market.

It is even advisable in some cases to sell our cotton goods abroad on a smaller margin of profit than at home if we expect to avoid the recurring periods of depression and stress which have characterized the industry in the past few years. We need mills that will be devoted particularly to the manufacture of goods for export as a permanent undertaking, we need American salesmen who will carefully canvass the foreign field, we must face the fact that we will have to arrange reasonable credit where it is the rule and where the standing of the importer justifies it, and we must be prepared, in the case of printed and colored goods, to make up and pack assortments in accordance with the requirements of the consumer. The American manufacturer in many respects is not surpassed by any in the world and in many lines of cotton goods we can compete with England and Europe. Heretofore we have exported less than 10 per cent. of our cotton manufactures as compared with 80 per cent. of the products of English mills which go to foreign markets. We have been too much concerned with the opportunities in our own country and have not felt the necessity of actively seeking an outlet abroad for our goods, but we are gradually beginning to realize that the continued neglect of the foreign field will increase the difficulty of entering the markets after they have been taken over by our competitors.

We cannot hope to use the foreign market in times when we need it most and neglect it when trade is active at home. It must be carefully cultivated and developed by constant study and attention, by ascertaining the requirements of the trade and carefully catering to those requirements, and by providing the facilities which will remove all obstacles to the increase of the trade. We should not be content to sell the foreigner only such goods as we cannot sell at home, but be in a position to furnish what he wants to buy. This policy backed by thorough knowledge of the field, faith, courage and patience will ultimately bring success.

[Accompanying Mr. Odell's paper were tables showing the world's trade in cotton manufactures

and the rank of the principal countries in cotton spindles. Also exports of cotton manufactures from the United States during the years from 1903 to 1913, and other statistics. These tables as well as copies of Mr. Odell's paper may be had on application to the secretary of the American Cotton Manufacturers Association.]

ADDRESS OF F. A. VANDERLIP

President of the National City Bank

The plan outlined for the creation of a comprehensive warehouse system, to be operated in a manner which will give the broadest currency to credit obligations based on cotton stored in these warehouses, is both interesting and significant. It is interesting as showing the tendency toward an important movement in the cotton trade. It is significant in indicating an awakening on the part of business men to certain distinctions in banking credit that are of great importance.

During the discussion connected with the enactment of the new banking law, there has been much education of bankers and business men alike on the subject of ideal banking credit. Not having reached, in all respects, the settled commercial status that we find in some of the European countries, we have failed here to draw the distinction that is so clearly drawn in most European banking centers between loans for capital purposes and loans of a self-liquidating character, the funds for the repayment of which must naturally and almost inevitably come promptly into the hands of the borrower in the seasonal course of his business.

Our new banking act was designed to accomplish various things. In the minds of some of its advocates the things sought to be accomplished I fear were not entirely economic. But the fundamental economic principles back of the idea which led to this legislation prominently included the creation of a discount market. That is to say, the creation of a form of bankable paper which would be so secured through the names of acceptors and indorsers that the credit risk disappeared and the paper would find a ready market wherever there was money to loan, even though there existed in those quarters no knowledge regarding the credit of the original maker.

Whatever will tend toward the creation of such a discount market will be helpful in lowering the rate of interest which the commerce of the country must pay. Whatever will tend to give broad currency to commercial paper, a currency wider than any knowledge of the maker's credit, will tend toward an equalization of rates, toward sounder banking conditions, and toward a lowering charge on commerce for interest. Such a proposition as has been here presented for giving a wide currency to loans made against cotton in warehouses is a fundamental movement, the first among a good many others now gathering force, I believe, that will eventually lead to a great discount market, where idle funds from the whole country, and, indeed, from international money centers, may find sound investment in short term commercial credits.

Although we supply nearly two-thirds of the raw cotton of the world, I still believe that we present, in our methods of cotton production, one of the most gigantic examples of incompetency to be found anywhere. The huge and rapidly growing totals of our cotton crops are sources of satisfaction until we examine them in connection with our acreage. That examination discloses fourtenths of a bale an acre is about the average of our production. In that figure, I believe, is to be found an important indictment against the United States, although it is by no means a type of indictment that lies solely against the cotton planters of America.

PRODUCTION OF COTTON

We are now devoting about 35,000,000 acres to the production of cotton, and a good crop is about 200 pounds of ginned cotton an acre. The Department of Agriculture, which seems to be the one arm of our Government truly devoted to upbuilding an intelligent development of our resources, has demonstrated beyond any question what a shamefully small average yield this is.

At the present time the Government has an arrangement with about 525 county agents in Southern territory where cotton is the principal crop. These county agents carried on demonstrations with 12,000 individual farmers last year. The acreage involved was 104,000 acres. On these acres the Department's instructions were carried out by the farmers with their own tools, teams, labor and fertilizer, the Department merely furnishing the instructions. The result was an average yield of 1,005 pounds of seed cotton per acre. In the States where these experiments were carried on the present average yield is 546 pounds of seed cotton per acre. It is therefore claimed by the Department of Agriculture that as a direct result of the instructions given to a limited number of farmers the number of pounds of seed cotton produced was increased by approximately 95 per cent.

Taking up the discussion of present business conditions Mr. Vanderlip said:

We are today a nation grown critical of business methods and resentful of business accomplishment. By far the greater part of Government energies, as related to business, are directed toward destructive rather than constructive and creative ends. Business men have been called to account by Congress, commissions and courts, and are being punished for past deeds and hampered in present activities. The managers of railroads, although they have given to the public an average freight rate much less than what similar service costs in other countries, are bound with ever increasing bonds of hampering regulations, and are held to the strictest accountability for any failure of administration which falls below a hundred per cent. of efficiency.

If a railroad manager is culpable and is answerable to society for anything less than a hundred per cent. of efficiency what of the farmer and planter, holding the great agency of production—land—and utilizing it with but forty per cent. of efficiency? That is the indictment that stands against no small part of the agricultural community—a conduct of their business on a basis of forty per cent. of efficiency.

It will not do to say that railroad managers and corporation heads are the representatives of pub-

licly subscribed capital and are therefore subject, in the interests of society, to a surveillance that applies only to the affairs of a public corporation, while farmers represent only personal investment and may be left to work out with such ignorance or intelligence as they choose to bring to bear the conduct of their own affairs. Farmers and planters also owe something to society in the way of intelligently conducting their business. They hold the means of production in their control. The public interest and the common good demand that they exercise that trust with intelligence, efficiency and thrift quite as rightly as does public opinion demand efficiency and honesty in business administration.

Prices of produce go up in answer to the inexorable law of supply and demand; values of the great agency of production—farm lands—have risen in our memory two or three hundred per cent., not because those lands were more efficiently managed, but because the demands of hungry mouths and backs to be clothed have made prices that permitted much increased values, even when not accompanied by increased efficiency of management.

Is it not time for the maligned business man to direct some attention to the honest farmer and to ask whether the people, whose demands the politicians are so fond of formulating, should not have directed against them and their small business methods some of the same analytical criticism that it has been the order of the day to direct against big business?

I believe that as a nation we have for some years been attacked by a hysteria of criticism against big business until a majority of the people have come to believe that the way to secure prosperity is through legislation, instead of through intelligent hard work, improved methods, and a scientific application of the best knowledge of their own business. If you can do anything to direct the attention of the cotton planters of the South, or of the farm-treatment. Business conditions are unsatisfactory, however, on account of fundamental reasons that are deeper than can be cured by one or both of these factors. The incentive for business men to take new risks, to expand their activities, to lead them toward the inception of new or greater enterprises has received a serious check in the unfair attitude of public opinion as exemplified in Congress, by commissions, and in the printed page that reflects and molds the state of public opinion. I do not believe that we can hope for permanent relief from the unsatisfactory position in which business is now placed until we can get a public opinion that more truly reflects a fair attitude, based on correct economic principles.

It seems to me the highest duty of business men, particularly such an influential group as is represented here, to contribute the best that is in them toward the creation of a wiser, a sounder and a more intelligent public opinion in regard to business affairs. That can neither be done by silent acquiescence nor by dissatisfied grumbling at existing tendencies. You must take your active part in forming public opinion. It is time for business men to speak out. Where errors and mistakes have been made let them be frankly acknowledged, but insist upon a better understanding of your methods, your problems and your aims. Let your voice be heard and your views expressed with frankness and honesty, and we may then hope that an intelligent and informed public sentiment will give to business men fair play and to business an enduring foundation upon which sound prosperity may be solidly built.

REPORT ON TARIFF AND LEGISLATION

The committee on tariff and legislation reported through its chairman, R. M. Miller, Jr., of Charlotte, N. C.

Mr. President and Gentlemen of the Association: Since the last meeting ot the Association our committee issued an additional Bulletin No. 7, which we present for record, and this completes our work.

This bulletin contains the old and new tariff rates in convenient form for ready reference, and taken in connection with the six bulletins previously issued, makes a complete and compact history of the tariff question.

Your committee has not accomplished the results hoped for nor possibly what some of you anticipated, yet we feel that the work done will bear such fruit in the future as to fully justify the time expended and the expense incurred.

Our work, however, has been, in a large sense, largely a campaign of education, inducing cotton manufacturers to think who had never before thought on the tariff question. At the outset of our work many were indifferent and apparently not in sympathy with the efforts of the committee, but in the heat of the fight on the tariff schedule this indifference and lack of interest rapidly disappeared, and now we find every cotton manufacturer is active and fully alive to the necessity in the future of being thoroughly familiar with every detail of this great question.

The schedule of rates under the present law are low, much lower than we endorsed or advocated, and against which we protested most earnestly and vigorously, and we feel that we should congratulate ourselves that the rates are not even lower and more drastic. The efforts of your committee and associates, however, were exerted at the opportune time, and succeeded in modifying the more extreme schedule in the Congressional Committee.

Our industry in our judgment has not yet felt the full effect of the present tariff rates. Importation of textile goods for the first five months under the new law are somewhat in excess of the same period under the old law, but not to such an extent as to cause alarm. We attribute the small importations to the fact that the cotton business has been unusually active and profitable abroad for quite a while, while our American trade has been depressed, and in many cases unprofitable, hence our market is not yet attractive to the foreign manufacturer. However, when these conditions are reversed and our trade improves, and foreign markets become depressed, then we must be

prepared for and expect to meet the fiercest kind of competition.

To maintain our market, therefore, is going to test the nerve and ability of every cotton manufacturer in this country, and though straining under this new load imposed upon us, and beset on all sides by more or less adverse influences beyond our control, yet let us determine to stand together and refuse that unsupported charge of one man that we are "industrial cowards."

We urge you, therefore, not to forget the issue nor become indifferent to its possible disastrous consequences, but to the contrary remain firm and steadfast in advocacy of a law fair and just to the American cotton manufacturer and to the American wage earner. Respectively submitted for the committee. R. M. Miller, Jr., Chairman.

REPORT OF LEWIS W. PARKER, CHAIRMAN OF THE COMMITTEE ON COTTON EXCHANGES

Your committee on cotton exchanges now renders this report to you at the conclusion of another year of effort on their part to secure reforms previously asked of the various cotton exchanges.

Your committee makes its report this time in a spirit of greater encouragement than evident in other reports.

The New York Cotton Exchange has either put into execution, or has assured the execution of, some of the reforms previously requested. It is to be regretted, however, that the Exchange has not gone further than it has in this direction, and it is to be further regretted that its progress in reform has been so slow and the reforms yielded by it spread out through so great a length of time as to not be of the full result they should be.

REFORMS SHOULD HAVE BEEN VOLUNTARY

As often previously expressed by this association, we believe that it would have been much better if needed reforms could have been accomplished by the voluntary action of the New York Cotton Exchange. After many years of delay, however, appeal has been made for Congressional action and there is now assurance that regulation will be had through Congressional action.

This association is not opposed to Cotton Exchanges; it believes it to be to the best interest of both producer and consumer, of planter, of merchant, of manufacturer and of the public that there should be through the publication of exchange quotations a correct knowledge on the part of all of the value of cotton as a commodity.

An Exchange, however, is assumed merely to fleet the price of the commodity in which it deals; it is the means by which buyer and seller are brought to a common basis; the barometer indicating the rise and fall in prices of the commodity in which buyer and seller are interested. When the Exchange thus reveals the price of the commodity, it is of value to all; it can guide the planter in the disposition of his product; though living in some corner in the back woods, he receives through the Exchange quotations, advices indicating him to demand a fair price for his commodity; the spinner is likewise so advised as to the price of cotton entering into the cloth and is therefore given information which may guide him in his sales.

QUOTATIONS SHOULD REFLECT REAL PRICES

There can scarcely be an argument as to the advantage of the knowledge of current prices to the planter and to the manufacturer; while the benefit of this knowledge is not so evident to the purchaser of the manufactured cotton, it is nevertheless recognized by competent authorities.

In a circular letter of Nov. 15, 1913, issued by Charles Fairchild & Co., members of the New York Cotton Exchange and mailed particularly to purchasers of cotton cloth, the advantage of this knowledge is clearly expressed as follows:

> "You undoubtedly find that close attention to the raw commodity will often assist you in buying your cloth at the right time, and therefore, add materially to your year's profit. The price of cloth is based largely on the price of contracts quoted by the New York Cotton Exchange, and we feel that your close attention to the conditions which cause changes on the New York Cotton Exchange would necessarily assist you in your daily business transactions."

This quotation merely emphasizes what this association has often claimed; that its members are intensely interested in the quotations of the Cotton Exchange, for whether these quotations are correct or not, the minds of the buyers of our products are influenced thereby and as a matter of fact, the prices we receive for our products are largely the result of the quotations of the Exchange, whether these quotations be representative of the price of the commodity or not.

An exchange fleeting the true value of the commodity it deals in is an advantage to the public and is to be encouraged; an exchange which arbitrarily states the value of that commodity with relation to the law of supply and demand as applied to the commodity, and whose quotations are merely the result of the manipulative effect of large operators upon it, is a curse to both producer and spinner. Such an exchange must and should be so regulated as to compel its quotations to correctly state the price of the commodity on which it quotes, or failing in such effort, such an exchange should be abolished.

It is in this light that we view the New York Cotton Exchange and unless its rules can be so regulated by action of Congress as to compel the performance of its proper functions it should in our judgment be abolished.

REASONABLE LEGISLATION FAVORED

We believe, however, that Congress will pass such legislation as will be corrective, in a measure at least, of the evils on the part of the New York Exchange complained of by us.

There are now pending before Congress a number of bills relating to Cotton Exchanges, some

MEMBERS AND GUESTS AT THE BANQUET OF THE AMERICAN COTTON MANUFACTURERS ASSOCIATION

of them prohibitive of exchanges, others regulative.

Your committee has opposed the enactment of such legislation as would be prohibitive; it favors an enactment of such as is reasonably regulative. In this light your committee has favored, with slight amendments, the enactment of two bills, one of these known as Senate Bill 110, by the Hon. E. D. Smith, of South Carolina, and which in its efforts to regulate would use the mails as a medium prohibitive of the use of improper manipulative contracts.

Your committee has also favored the enactment of House Bill 15,318, which is also regulative in character and declares in detail the characteristics of the proper contract, taxes a contract conformed to the requirements of the law in a very slight measure, while taxing the contracts not in accord with the legal requirements, in great degree. The House Bill goes in greater detail into the features of the contract to be recommended and regulated. It is most carefully and ably drawn and your committee is rather disposed to believe that the exercise of the taxing power will be a better means of regulation than the prohibition of the mails.

TAXING POWER SUGGESTED AS A REMEDY

However, we would express our earnest appreciation of the efforts on the part of the authors of both the House and Senate bills referred to, to accomplish the results sought. We believe that each bill will be of great benefit if passed; we believe further, however, that results can be best accomplished by the use of the taxing power and we recommend therefore, that the Senate Bill 110, which has already passed the House should be amended so as to provide for the use of the taxing power in regulation of the Cotton Exchanges and should be further amended by many sections of detail appearing in the Lever Bill, not appearing in the Smith Bill.

Your committee commend the authors of these two bills and express their thanks for the action of the United States Senate which practically unanimously passed the Smith Bill, also commend the earnest consideration that this subject has had by the Agricultural Committee of the House.

There is no real conflict between these two bills. Both are aimed at the same result. Both will practically accomplish the same result, but there are some provisions of the Lever Bill which are more certain to accomplish the result than the provisions of the Smith Bill.

In general terms the requirements of the two bills are not dissimilar. Both bills would require a contract on the Exchanges which is not in a measure outlawed, to contain the following requirements.

1st. Recognition and acceptance of the standard grades made by the Government.

2nd. Recognition of middling as the basis of the cotton.

3rd. Requirement that the differences at which grades above and below middling should be deliverable be established from day to day or as often as necessary by the Secretary of Agriculture, his determination to be based on actual market differences prevailing in an average of markets in which the commodity is actually bought and sold for commercial use.

4th. The prohibition of deliveries on contracts of cotton of undesirable character.

The Smith Bill with reference to this subject states as follows:

> "That in determining, pursuant to the provisions of this Act, what markets are bona fide spot markets, the Secretary of Agriculture is directed to consider only markets in which spot cotton is sold in such volume and under such conditions as customarily to reflect accurately the price of middling cotton and of other grades of cotton for which standards shall have been established by the Secretary of Agriculture."

This is as desired by this association and we commend the clear method of its expression in the Smith Bill.

The Lever Bill is more clear in its expression of the characters of undesirable cotton prohibitive under delivery than is the Smith Bill, and in our judgment the provisions of the Lever Bill upon this subject should be incorporated into the Smith Bill.

SHOULD BE A MINIMUM FIXED FOR LENGTH OF STAPLE DELIVERED

We commend efforts to provide for a minimum length of staple which can be delivered upon contract, and it was with surprise that we learned at a hearing in Washington, the admission of representatives of the New York Cotton Exchange as to the extent to which cotton of 5/8-inch length in staple or even at times 1/2-inch length in staple has been delivered on contracts on the Exchange thereby depreciating to a great degree the whole basis of the contract and causing injury to both producer and spinner and benefit only to the manipulator who was using this distribution for a personal gain at the sacrifice of the legitimate business interests of the country.

We believe such use of the New York Cotton Exchange has been made within recent months. There has been presented within the last three months the publication on the part of the New York Cotton Exchange of quotations of its contracts for delivery indicating the price of the raw material at times as much as two cents below the real value of that material and two cents below the price that the producer was obtaining therefor in the South, and fully two cents below the price being paid by the spinner for delivery of it to him. Necessarily this has been most injurious in its effects to both spinner and producer and has had the effect of misleading buyers of cloths and giving them an erroneous impression of the price of the raw material being used in consumption. None of us like to be imposed upon and it is most natural that the buyer of cotton cloth who conceives from quotations of the New York Cotton Exchange that the price of the raw material is two cents less than it really is, should fight most earnestly the payment of prices necessary to be

secured by the spinner in order to make any profit in production.

IMPROPER USE OF NEW YORK COTTON EXCHANGE BY LARGE OPERATORS

These low prices on the New York Cotton Exchange we believe to be the result of manipulation on the part of large operators who are able to use the New York Cotton Exchange as a means of depressing prices on account of the fact that the rules of the Exchange permit arbitrary differences, the delivery of undesirable cotton, thus depressing the whole basis of quotations; we deplore conditions under which large operators can through manipulation and improper use of the Exchange, depress cotton at one time and advance it at another, when the actual price of the raw material is changed but little if any during the interval. We cite in this connection the action of large operators on the New York Exchange in practically making a corner in March contracts causing advance of these contracts to 80 points over May contracts when the natural law of economics would justify a price of 20 points or certainly 10 points on the part of May contracts over the March.

These conditions could and should have been regulated by the New York Cotton Exchange itself. After many earnest pleas this Exchange has failed to regulate and we now, as stated, commend the efforts of Congressional leaders to regulate by law that which could and should have been regulated by the Exchange itself.

We are aware of the fact that it is claimed by some that the contract which is sought to be secured by Governmenal action is the spinners contract, and it is claimed by some it would be contrary to the interest of the planter.

FAIR PRICE TO GROWERS DESIRED

At no time in the history of this association has it sought to depress prices of cotton. It believes that the producer of cotton is entitled to a fair return for his commodity and the members of this association are at all times willing to accept the arbitration as to price fixed by the natural laws of supply and demand. We condemn, however, manipulation whether its effect be to advance or depress prices. The general effect of manipulation which we complain of has been to depress prices, and the only times that this association has expressed its position relative to the manipulative quotations of the New York Cotton Exchange has been when the effect was to depress prices.

We acknowledge that the contract which we commend in other sections of this report will have the effect of raising the quoted price of cotton; the producer will therefore be given knowledge of the fact that his commodity is worth much more than it is quoted as being worth on the New York Cotton Exchange. We believe the effect of this will be to push the price of the raw material higher in some degree and certainly to guide the producer against imposition in the sale of his product. Notwithstanding this, we favor legislation because all that is desired and sought by this association is to accomplish such results as will force the Exchanges to indicate in their quotations the real price of the raw material; to reflect by their quotations this value rather than to issue quotations misleading as to prices.

We earnestly urge provisions of all characters with relation to the Exchanges which are fair to both buyer and seller, enabling thereby a higher base of price to be recorded than is now indicated on the Exchanges.

If this be a spinner's contract, then surely it is also a contract to be sought in behalf of the producer. This is certainly the view taken by members of Congress for it is well known that the authors of both the Smith and Lever bills have been most earnest in advocacy for many years of legislation in behalf of the cotton producer, in fact so earnest that Senator Smith is commonly known as "Cotton Smith."

The interests of the spinner and the producer in the matter are the same.

We, therefore, earnestly commend efforts to regulate the unfair practices on the Exchanges, particularly on the New York Cotton Exchange. We believe that the New Orleans Exchange in the future, as in the past, will be operated so to meet the reasonable requests of this association of the public and of Congress and that the New Orleans Exchange can be relied upon to remodel its contracts in any way necessary to establish a parity between the quotations on the Exchange and spot prices of cotton. This is all we desire and could ask.

Respectfully submitted,

Lewis W. Parker, Chairman.

JOHN P. WOOD ON THE TEXTILE BUREAU

John P. Wood, director of the Textile Bureau, said that the members of the Association ought to cooperate as closely as possible with the bureau in its work in behalf of domestic textile manufacturers for the proper administration of the new tariff law. Mr. Wood said that loose administration of the law had worked out against domestic interests, first, through deliberate undervaluations on the part of the importers; secondly, through loose phraseology in the tariff law and the lack of proper interpretation of its various terms, and, lastly, because of the lack of authoritative testimony before the customs authorities, which had resulted in adverse decisions to domestic manufacturers which could be contradicted and set straight if the domestic interests would take enough pains in the matter to present authoritative testimony in the customs court rather than to let cases go against them because they had not taken pains to present them properly. The bureau plans, he said, to refute erroneous testimony and present the facts to the proper authorities. Mr. Wood urged the cooperation of the members, and asked them to notify the bureau, or himself personally, of any undervaluation or loose administrative features in the tariff law which might come to their notice.

A. M. PATTERSON ON THE TEXTILE ALLIANCE

Mr. Patterson took up in this connection a few of the trade abuses in the purchasing of supplies. The Alliance could do considerable and valuable work to prevent grafting in the purchase of supplies, but it was up to the individual manufacturers to keep an eye on their employes and to see that they had some proper standard of honesty. The Alliance cannot directly look after this matter of dishonest employes as well as can the mill owners and the owners of finishing plants, he reminded.

Mr. Paterson said that some good work had already been done, and much more could be done with the cooperation of the various manufacturers in the textile industry.

"When your president asked me," he said, "to address you on the subject of the Textile Alliance, Inc., in which your association has taken a friendly interest, I was embarrassed by the previous publication of that organization's objects. To avoid repetition I am going farther afield and will try to interest you in the general subject of economic waste in our trades, as distinguished from practices which are outside the pale of the law.

"Since Adam Smith, every economist has had something to say of the distinction between productive and unproductive labor, and it is now generally accepted that any labor is productive that performs a useful function, whether in actual manufacture or the manifold side issues of salesmanship, law, and scientific investigation. To be useful, such functions must be wisely directed and economically operated, otherwise, even though entirely legal, they pass into a class which is truly parasitic and their practitioners cannot claim even the excuse for continued existence that justifies the drone in the bee-hive, the reproduction of the species.

"During the preliminaries of the formation of the Textile Alliance, many such cases were found. Here is a typical one:

"One of our friends bought in a few years from the manufacturer who made his soap some 1,900 barrels of alkali for $1.85. He was told that it was specially adapted for use with this particular soap and it was billed under a name which signified nothing. A competitor caused an analysis to be made, when it was discovered that the alkali was Soda Ash, market price three-quarter cent per pound. Note the waste involved in this transaction. The mill could buy direct from the maker and pay a single freight. Instead it paid two freights and an extra packing charge, besides a profit which though small was unearned. There was no misrepresentation because the alkali was a standard make, pure, and adapted to be used with the soap in question; or with any other soap for that matter.

"There is a brand of alkali on the market advertised to possess peculiar virtues in textile manufacture. Perhaps it does, but when submitted to a mill chemist of long experience he said: 'If you are buying this for sodium carbonate it contains too much bicarbonate; if for bicarbonate, too much carbonate.' There was, in fact, about two-thirds of one, one-third of the other, and traces of ammonia and sulphuric acid. For this useful combination about twice the market price is charged.

"There are products on the market, however, which present real economies and economic savings of value. Thus it has been discovered that a paper mill waste may be used as a substitute for lactic acid and tarter in mordanting. The discovery is not new and is not patented, so that a moderate profit ought to content the intermediary between the dyer and the paper mill. I leave it to you if 11 cents per pound is a fair price for a substance which costs not much more than the freight and packing in barrels.

"Passing from distribution to manufacture, we can all agree that if any class is entitled to liberal reward for enterprise, etc., it is that which persuades two blades of grass to grow where one grew before, or develops in half a century an enormous industry from a purely waste product. From coal tar, which was in the early days of gas lighting a nuisance that could not be disposed of, a group of firms and corporations have developed innumerable combinations valuable in medicine and industry. For good measure they have thrown into the scale discoveries in other branches of science, such as the manufacture of fertilizer from the air, and the cure of disease. They have developed scientific organizations and build plants without equal in the world, and unapproached in this country except in the electric industry. That they are entitled to an exceptional reward is undisputed. Under the laws of their country they may fix this reward themselves and in many cases have fixed it by establishing on their products a 'distribution price' or 'losungspreis' at which they sell to large customers or consign to agents and branches for distribution in foreign countries. They have done this fairly, the legality and propriety of their acts cannot be questioned under the laws of their own country or in morals; but at this point begins an example of economic waste which is hard to parallel in the annals of commercial extravagance. Let us recognize that the business is technical, that it is hard to introduce a new product, that competition is keen. Even so, merchants know that a salesman who gets 15 per cent. on his sales is overpaid, if he keeps it, and that a branch house is an important textile center that can be operated on an expense ratio less than 35 per cent. of its gross sales. What becomes of money thus spent is beside the issue; my statement is that it is either subtracted from the due of a manufacturer entitled to a legitimate profit or added to the cost of a consumer who also has rights, however remote he may be. And the worst of waste such as this is that it breeds more waste. On the one hand useless transportation and the other expense items, salesmen and rents; on the other hand the inducement to the employe in receipt of a secret commission to recommend an inferior article and use more of it than he needs that his commission may be larger.

"For most impositions no Textile Alliance and no system of laws can ever furnish a remedy nor can political economy point one out.

"The remedy is in your own hands. If the laborer is unworthy of his hire, find others, and always bear in mind the maxim: "Caveat emptor' —let the buyer beware."

The National Association of Cotton Manufacturers

Despite the many attractions of the Textile Show the annual meeting of the National Association of Cotton Manufacturers in Paul Revere Hall was marked by an unusually large attendance and great interest in the proceedings. The first session on April 29 began promptly on schedule time, the first business being the reading of the secretary's and treasurer's report, which were approved without discussion. Stuart W. Cramer, the chairman of the committee on association medal then made a report. He stated that the award of the medal this year had been a task of the usual difficulty, owing to the general excellence of the papers that had been presented to the association. After careful consideration the committee had decided to award the medal to Arthur T. Bradlee, of Boston, for his work in connection with the application of the science of conditioning to industry and trade. Mr. Cramer referred to the prolonged and exhaustive tests that had been made by W. D. Hartshorne to determine the moisture regain of textile materials, and for which Mr. Hartshorne had received the association medal. That was scientific

ALBERT GREENE DUNCAN, ELECTED PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

work and, continued Mr. Cramer, the work of Mr. Bradlee in applying the science was equally deserving of recognition. Mr. Bradlee, after receiving the medal, made a short address in which he expressed his appreciation of the recognition he had received and called attention to the great importance of standardizing moisture in textile materials.

Gov. David I. Walsh delivered a very appropriate address of welcome, in which he stated that there was no so-called labor bill before the Legislature this year, and expressed the opinion that time should now be given for the trade to adapt itself to the legal regulations of the textile industry which had been placed on the statute book in recent years. The Governor's address was in part as follows:

EDWIN FARNUM GREENE, RETIRING PRESIDENT OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

No government should pass a single law antagonistic to industry except in the interest of public health. My message to you today is that you should feel that what has been done by legislation in the past, seemingly against industry, has been

done with good intention and not in a spirit of malice or antagonism. We have now reached the point where we feel that we have gone too far in labor legislation. We must now strive to make the existing laws solve the labor and industrial problems rather than try to pass further legislation restricting industry. It will interest you to know that there is not now pending in the Massachusetts Legislature one single labor bill which you manufacturers would be strongly opposed to. And I must remind you, as it is my right and duty as a politician, that this improved condition is all because the state has a Democratic governor.

VIEW OF FLOODED DISTRICT, SHOWING INUNDATION OF COTTON LANDS AND RAILROAD IN THE MISSISSIPPI DELTA

New England industries will be driven out of business unless we can have a good transportation system. What we want here is a Massachusetts railroad managed and financed by Massachusetts men.

The response to the Governor's welcome was made by R. M. Miller, of Charlotte, N. C., who referred to the opinion held a century ago that it would be difficult to dispose of an American cotton crop of 350,000 bales, and said that the county in which that opinion was current now contributes more than 350,000 bales to a total crop of 16,000,000 bales. Mr. Miller then spoke with great emphasis on what he considered was the most serious danger to the coton industry at the present time, namely, restrictive and oppressive legislation.

At the second session on Wednesday former Mayor John F. Fitzgerald, who presented a paper on export trade, digressed from his subject to suggest that an invitation to the Textile Show be extended to the students of the Boston School of Commerce. F. H. Bishop was called to the platform and stated that the managers of the Textile Show would be glad to extend every facility to the students to study the exhibit..

An opportunity was given to John A. Fox, Memphis, Tenn., to address the convention as the representative of the Mississippi

Levee Association. Mr. Fox made a forcible appeal to the cotton trade to aid in bringing about the building of a system of levees along the Mississippi to protect from inundation an area, which he estimated at 13,500,000 acres, of the best cotton land in the world. Mr. Fox's remarks, illustrated with wall maps, were in part as follows:

ADDRESS OF JOHN A. FOX

Secretary-Manager of the Mississippi River Levee Association, Memphis, Tenn.

I have asked for the privilege of addressing your Association briefly because we of the great Mississippi Delta have a great problem to solve in which every cotton manufacturer is directly interested and we want you to help us.

SCENE IN A COTTON FIELD IN THE MISSISSIPPI DELTA

There are in the Mississippi Delta in the States of Missouri, Tennessee, Arkansas, Mississippi and Louisiana, 20,000,000 acres of the finest cotton producing land in the world and because of the uncertainty of protection from floods only about 3,500,000 acres of this land is in cultivation. This delta land is composed of the very richest soil of the Continent and when put in cultivation will yield a bale to the acre with but ordinary care and attention. It is peculiarly adapted to the growing of "benders" or long staple cotton and if we can secure protection from the floods that come down upon us almost anually we can reclaim and utilize about 13,500,000 additional acres of this rich land during the next ten years. This will enable us to add 10,000,000 bales of long staple cotton to the present output of the American cotton crop. All that is needed is a recognition by the national government of the project as one worthy of national attention. We believe that if the matter were fully understood by people throughout the nation that Congress would be urged to adopt the project and appropriate sufficient funds to complete it during the next five years. We of the delta have ourselves expended $70,000,000 since the Civil War trying to complete our levee system and about $57,000,000 are still needed to finish the work.

Since the water of thirty-one States or more than 41 per cent. of the entire area of the United States causes the damage, we feel that the whole nation should help us in keeping these waters off of our lands, and we are now doing everything in our power to bring the matter to the attention of President Wilson and Congress so that definite action may be taken. The enormous losses that are sustained by that section of the country when these floods come upon us, about once in every five years, run far up toward the hundred million mark, and yet plans for controlling this great river in the heart of the nation have been perfected since 1880, and the estimates of the engineers show that the entire levee system can be completed for $57,000,000 and that country given absolute protection.

We feel that you of New England have a com-

mon interest with us in this problem and that you will aid us in bringing the matter to the attention of Congress so that some speedy definite action may be taken. It is not a local matter as you will see and it certainly merits the attention of all far-sighted and thinking men when I tell you that at a conservative estimate ten million bales of long staple cotton can be added to the annual cotton crop of this country.

I sincerely trust that you will do all in your power both individually and collectively to aid us wherever possible.

PRESIDENT'S ADDRESS

BY EDWIN FARNHAM GREENE

We cotton manufacturers are met here today for our ninety-sixth meeting. As we survey the events of the past few months we are not over hopeful. A tariff bill was enacted last fall, the last provision of which, so far as textiles are concerned, went into effect January 1, with the reduction of the duty on wool goods. This readjustment was a most serious one with the woolen and worsted mills of the country. As is well known, the losses through curtailment and shrinkage of inventory last year were very large for most of the companies. The result is that even today some of the larger woolen mills are still idle and others are radically curtailing, and it is safe to say that most of the mills are operating on the smallest margin of profit if indeed there is any profit in the present business. What I fear most is that the full effect of the tariff has not been felt. The cotton manufacturers perhaps have not been seriously disturbed in most lines by direct competition from the foreign manufacturers. However, on fine goods, particularly of a fancy nature, competition has been in evidence, and yet the cotton manufacturers, as a whole, are not as alarmed as those in the other large branches of the textile industry. This is an ad valorem tariff, and with prices fairly high as they are today, the margin of protection is greater than it will be later when the industry suffers a posible severe setback and foreign prices fall to a lower level.

One step forward has been taken during the past few months in the organization of the Textile Bureau. The primary object of this is to protect the interests of the domestic manufacturer in all customs matters, and particularly to assist in preventing undervaluations and the fraudulent practices of some importers. In this we are not working contrary to the national government or any of its departments or officials, but are only cooperating in the enforcement of the laws of the land to enable the honest importers to do a legitimate business, and to see that the side of the domestic textile manufacturers is fully presented in important cases before the various boards and officials of the treasury department and the courts of the land. Heretofore, manufacturers of the country have not felt this necessary, but with a very radical change in the method of levying duties and the change in the administration, it has seemed important that the case of the domestic manufacturer should be presented as fairly and ably as that of the importer who necessarily is working in the interest of the foreign manufacturer. The work of the Textile Bureau has just started, and yet we hope much can be accomplished even this first year for the industry.

The changes in the tariff, as I have just stated, are likely to effect the textile industry, but apart from this the prosperity of the cotton mills is dependent to a very large degree on the general business of the country, and this seems likely to continue in a very unsatisfactory way unless some of the momentous questions that are now being discussed by Congress and the Interstate Commerce Commission are decided wisely. Congress at this very time is considering corporation bills which directly affect us, and unless sane legislation is enacted serious injury is bound to result to the general business of the country. It seems to be the consensus of opinion that the increase in freight rates demanded by the railroads is a necessary first step in the restoration of public confidence.

Moreover, there are several labor bills being considered by Congress. While we in New England cannot help feeling that the textile industry should in the long run be put on the same basis as regards labor legislation, nevertheless the Democratic party seems to be departing strangely from its ideals of state rights and individual liberty in the paternalistic program of the present day with its policy of uniform laws.

One of the most serious problems which we manufacturers have to face is the labor problem. It is not merely a question of wages or hours of work. A mere shortening of hours will not accomplish what the wage earners themselves really seek. It is a much larger question. As I have frequenty stated, we all believe in higher wages for the textile workers. The present schedule of wages should be maintained, but if the government seeks to impose unjust and unfair burdens, labor must bear its fair share of the load. We should consider very seriously any suggestion for a further decrease in hours of labor. We have been talking of the high cost of living for a great many years and one of the immediate causes of this is the shortening of hours and the consequent increase in the cost of production. There is a reasonable limit. We are all happier and after all better off with hard work, and so long as the health of the textile worker is not impaired and so long as sufficient time is allowed for recreation and improvement, the people of this country are beter off at work than with too much idle time on their hands. I, for one, believe that fifty-four hours of work in the week cannot possibly do anyone an injury,—even most boys and girls of fourteen and fifteen years of age, and certainly this weekly schedule of hours allows a good deal of time for other worthy pursuits. We are now forced to compete with foreign operatives working a longer number of hours than we do here in Massachusetts and at very much lower wages. Any further curtailment in hours must inevitably stand in the way of an increase in weekly wages, and the textile workers themselves and New England as a whole would be better off to work at least fifty-four hours a week and, when conditions warrant, secure an increase in wages rather

than work for the same weekly wages and shorter hours.

It is, perhaps, a sign of the times that one of the largest carpet mills in this country recently reduced the wages of all their operatives, including foremen, 10 per cent. I sincerely hope that this will not prove necessary throughout the industry, but it behooves us to consider carefully whether we are in a position to compete with the English, French and German mills if any further burdens of restrictive legislation, such as shorter hours, are imposed.

While the cotton industry is thoroughly individualistic and highly competitive, in order to meet the present conditions there must be a greater degree of cooperation. The results so far are discouraging to those who have tried to accomplish anything along this line, but there are some encouraging signs such as the establishment of the Textile Bureau.

In conclusion, as I retire from the presidency of this Association, may I express a personal word of gratitude to those with whom I have been associated these past two years. This Association has a great heritage and a still greater opportunity for the future. The need is there. Little has been done to accomplish this, due perhaps largely to the fact that we all have been facing serious problems in our own business, but I hope the members will realize the critical need of common effort and to this end support the new officers in a work which must be done.

SECRETARY'S REPORT

During the last year the experiences of the Association has continued to be similar to those of many years past, in that change of conditions have required new methods. They may not have appeared especially prominent, as one year is viewed with an adjacent one, but when the work of the organization between two years widely separated from each other is compared, the extent of these changes will be noted as indications of what is as necessary in technical organizations to prevent the growth of obsolesence as it is in any line of active manufacturing. With due respect to the value of precedents, it should be remembered that there must be greater attention given to the conditions of today, and nothing could be more strongly indicative of the advancement in textiles than the inevitable changes in methods which have been inseparably connected with those improvements.

Amid all these various changes in the scope of the work of the Association, there is one feature which has remained unchanged, and that is the vigorous efforts of the Association for the weal of the textile industry, according to the live issues existing at the time.

The unsettled state of the cotton manufacture has shown itself during the past year in the great amount of correspondence which has been received by the Association and all of the letters have received prompt attention which in many cases required special investigation.

So many of the questions pertaining to the cotton manufacture have assumed a form whose final solution must be made by public opinion, that the Secretary has prepared a number of articles on these subjects for the public press; and it apears evident that in the future conditions will require an extension of this line of work, giving to the public information on subjects in whose settlement public opinion is such an important feature, and it is no disparagement to state that in the past many errors of public sentiment have prevailed through the lack of accurate general information on these subjects from all classes of manufacturers upon the broad economic principles governing the operation of their establishments.

A TEXTILE LABORATORY

The Transactions of this Association, ever since the first publication of a paper upon the use of the microscope in the study of textile fibers forty years ago, have abounded in references to the commercial importance of the use of laboratory methods as adjuncts to the cotton manufacture; and of late years they have contained many papers upon the importance of conditioning, both from investigations in this country and the methods employed abroad, especially the important investigations of William D. Hartshorne, for which the medal of the Association was awarded, and later the work of the Committee on Conditioning of Cotton Yarn and Cloth.

A number of years ago, silk manufacturers established a cooperative silk conditioning establishment termed the United States Conditioning and Testing Company of New York City, and of late its work has been extended to examinations of wool and of cotton; and this Association has, through the accepted report of its committee on the subject, commended this establishment.

The official laboratories for the authoritative testing of textile materials and supplies, which abound in the textile centers of Europe, exert a predominant influence in the economies of textile manufacture, and have not been paralleled in this country, with the possible exception of the Textile Department of the Bureau of Standards at Washington, whose work is necessarily limited to that of the greatest patron of the cotton industry, the United States Government.

We have obtained President Maclaurin's authority to state that the Massachusetts Institute of Technology is willing to cooperate with this Association in any way that it can to assist in the establishment of a laboratory which under skilled supervision would be available for the examination of fibers, goods and supplies used in the textile manufacture. Such a laboratory would be of great use to the industry, as has been the case with those of Europe, in ultimately providing a source by which disputed technical questions in raw material, supplies and finished goods might have a place of authoritative settlement without resorting to the uncertain conditions of the law.

While it is true that a great deal of the chemical equipment to be contained in the new Technology buildings which are under construction at Cambridge would be available for this purpose, yet it would be necessary in addition to provide a certain amount of textile equipment and a force of specialists for this work.

Before such a department could be established at the Institute of Technology it would be necessary that the authorities of the Institute should be

informed as to the extent to which textile manufacturing and mercantile interests in this vicinity would endorse its establishment.

The cost of its maintenance under the conditions that would prevail at the Institute would be small in comparison with that of specialized laboratories of this class which have such a predominant influence in the economical conduct of textile industries abroad.

It is hoped that all textile manufacturers will transmit to President Maclaurin their views upon the subject, as this affords an opportunity which is unprecedented in its conditions, which would undoubtedly be of great value to the American textile industry.

While it is superfluous to remind the members of any textile organization of the valuable possibilities of such a laboratory, yet we will cite that in cotton alone, the cheapest of the textile fibers, on the minimum estimate of 2 per cent. above the regain, over $19,000,000 was paid by manufacturers for water in the American cotton crop of 1913.

Yet conditioning of textile fibers is one of the relatively minor functions of such a laboratory.

The resultant function of such a laboratory would be its opportunities which it would also afford for special investigations, and it is through the line of such work that many of the most important improvements in textile development have been obtained in recent years.

This would indeed be a most fitting sequel to the work of this Association in devising standard sales notes, which have provided a legal basis for merchandising in yarn and plain cotton goods, which are both strictly technical in their specifications and legal in their provisions, for the purpose of avoiding misunderstandings and differences which might lead to litigation.

THE STUDENT'S MEDAL

The Student's medals for the encouragement of textile education, which is supported by a fund donated for that purpose by the late Moses Pierce of Norwich, Conn., July 13, 1900, have been awarded this year to Edward Webb Clarke, Boston, Mass., a graduate of the New Bedford Textile School; Kenneth Bartlett Cook, Concord, Mass., a graduate of the Lowell Textile School; Hugo D. Heidgerd, New York City, a graduate of the Philadelphia Textile School; and Charles Clifton Muir, Taunton, Mass., a graduate of the Bradford Durfee Textile School.

At this session Ralph M. Odell presented a very interesting paper on "Africa as a Market for American Cotton Goods."

During the reading of the papers at the third session on Thursday morning John P. Wood, a director of the Textile Bureau, addressed the convention on the work of his newly founded organization. He gave a very clear explanation of the intricacy of the technical problems arising in connection with the administration of the tariff, and of how important it is to the trade to have these questions properly attended to as they arise. He also spoke of the need of standardizing the requirements of factory inspectors, his remarks being in part as follows:

ADDRESS OF JOHN P. WOOD

The Textile Bureau, as probably most of you know, was organized under the auspices of a committee of the five textile associations—your own, the American Cotton Manufacturers' Association, the National Association of Wool Manufacturers, the American Association of Woolen and Worsted Manufacturers and the Arkwright Club. Its purpose can probably be best explained by the experience of two little children playing hide and seek in a house, who were inadvertently locked in a closet, and the little girl said to her companion, a boy, "You kick while I pray." And as I understand, while you are hoping and praying for better conditions the Textile Bureau is to do some kicking in respect to the conditions under which imports come into this country.

It is a new field. We have very little in the way of precedent to go upon, and for that reason we especially need the cooperation of all members. This field will have to do with several departments or phases of that work. In the first place, there is the plain, simple case of deliberate fraudulent undervaluation; the kind of invoicing which is done by the man who, like the politician, wants to walk the narrow path betwixt right and wrong and veer neither to one side nor the other. In order to ascertain when there is fraudulent undervaluation we must have the cooperation of members, with all their selling officers or selling agents. We do not need you to prove the fact, but we do need your suspicions. When you find foreign fabrics or textile products of any kind coming into competition with your own, that seem to be priced at so low a figure that there is a reasonable doubt of their paying the proper duty intended by the government, we want you to communicate the bare fact to us. From that point on we can secure the cooperation of the government. I want to impress upon you that the customs service, irrespective of any predelection of one administration for protection and another for tariff for revenue—the customs service is sincerely desirous of collecting all the duty that the law will allow, and they welcome all the help that we can bring to them.

The next phase of the work has to do with classification and interpretation and regulation. There is, for example, a field in which the Treasury Department makes regulations. I do not know that it concerns so much cotton manufacturers as it does woolen, but there is one typical case for revised regulation. Under the existing conditions it is possible to bring into this country any quantity of textile fabrics as samples so long as they are not in condition for commercial use. In the woolen trade—I do not know whether it is true in the cotton trade—there are certain classes of concerns who do a catalogue business, in which they send out an enormous number of catalogues containing samples of the fabrics that are made

up into their garments. The proportion of material which they buy that is cut up into these samples is prodigious, amounting to as much as twenty or twenty-five per cent. of all they buy of the stuff. In other words, such a concern may give in the course of the season aggregate orders for twenty-five pieces of a style, and of those twenty-five pieces five or six or seven will be entirely cut up into small pieces and used for their sample goods. Now, under the sample regulations all of those samples, if cut up on the other side, come in free.

That means that in the case of a cloth subject to a duty of thirty-five per cent., if as much as twenty per cent. of the total requirements are brought in free as samples, the real duty, so far as the domestic manufacturer selling the same kind of cloth is concerned, is reduced to about twenty-eight per cent. We already have the assurance of the Department that they will see what can be done toward remedying that condition of affairs, the intent of Congress evidently having been to permit foreign samples used for the purpose of the first sale of the goods to the first purchaser in this country to come in free, and not the subsequent samples to be used for subsequent retail distribution by the buyer in this country. The Department already has special agents investigating to assure itself that the practice is now carried on lawfully and legitimately to the extent I have described. We are assured of all the rectification they can give to that particular abuse, although it may be necessary before it can be wholly relieved to have an act of Congress revising the sample allowance.

We have another class of cases which depend upon the judicial decision of the appraisers or Board of General Appraisers. There was lately decided a sponging case. It had been first held that the cost of sponging goods on the other side was not properly a part of the original cost of the fabric, and the collector of the port therefore added that cost under what are known as "added expenses and charges," subject to duty if of a certain class. The importer contests that and says that it is not an expense which adds to the value; that the purpose of examining and sponging is simply to ascertain whether the goods are sufficiently perfect to bring over to America; they therefore had the examining and sponging office for that purpose in Great Britain.

The government contested that case. Not a single witness having expert knowledge appeared on behalf of the government, while the representative of the largest cloth jobbing house in America was present to testify that the whole purpose of this "damping," as he called it, was merely because in the course of the examination the cloth got mussed and had to be repressed, and in order to satisfactorily repress it it had to be damp. And when the lawyer, who had no technical knowledge of it, got pretty nearly the point by asking whether that was not shrinking—wasn't there something they called "London shrinking"? "Well," he said, "there used to be, but I always regarded it as a fake and I haven't heard much of it in the trade for several years past." Now, you can readily see that the added cost of the sponging is an added expense that adds to the cost of the cloth and is a proper subject of duty. But not only that, if the cloth has lost five per cent. or seven per cent. or whatever it may be according to the amount of shrinking, if it is billed at the shrunk length, but at the unshrunk price per yard, you can readily see that there is a case of undervaluation of rather a subtle kind.

The matter has been brought to the attention of the Department and they are willing to have another test case made. The government will appeal the next case of the kind that comes along and when it is tried this time they will have the benefit of whatever advice our staff can give and whatever testimony can be offered by American manufacturers and American sponging houses in New York, who also have an interest in that particular question.

There is another class which depends on judicial decisions as to classification. Under the late act there has been decided a case within the last couple of weeks, which originated some time ago, where cotton velvet treated on the back to make it damp or waterproof was imported, and which as velvet or plush would be subject to a duty of sixty per cent. under the act of 1909. The importer claimed that it was waterproof goods. "Waterproof goods," when Congress passed the act, did not contemplate such things as plush; it contemplated an ordinary plain cotton cloth. It was subject to a duty of fifty per cent. The importer contends that this, being waterproof cloth, should come in at fifty per cent. duty, and under the evidence offered, it is so decided. So we therefore have the situation that a cloth which, before waterproofing, would have been subject to a duty of sixty per cent., after an added expense and added labor to make it more valuable by the waterproofing process, comes in under a judicial decision at ten per cent. less duty.

Those are things which by the presentation of proper evidence can be avoided, and that leads to a third phase of activity for this bureau. There will be, of course, further revisions of the tariff. When they are made all defects of that kind should be provided against in the phraseology of a new act, and it should be the business of this bureau to collate such a body of information upon all of these disputed points, and in respect to all these loopholes. Then, when it comes to the writing of a new tariff they can advise the legislators in the framing of that tariff as to the things which must be guarded against.

I want to refer for a moment to another thing which has not so much to do with duties as for your information. There has been some time ago a desire expressed on the part of the cotton goods trade for more detailed statistics as to imports. It tells them very little as to what is coming in of the class that they are particularly interested in to report so many millions of yards of cotton goods. We have had that up with the Department by which the statistics are compiled. They are anxious to assist the American manufacturers by subdividing these classifications so as to give to the American trade a better knowledge of the kinds of goods that are coming in, but they want your advice as to what sort of a classification is

necessary. I have with me a letter from the head of that bureau in which he says:

> "We are trying to reach a decision in regard to the classification of cotton and wool and textiles. Any suggestion you might give us in regard to the classification of such products in which the interest is most pronounced will be much appreciated."

That has already been referred to the executive officers of this Association, and I trust we may have through their good offices such information as will enable us to put before the Department a knowledge of the kind of subdivisions that will be desirable. That is about all I have to say because this is more in the nature of an announcement, and the field being so new, we can only indicate what we want to do. We do not want to boast and promise what is going to be. It is experimental. A year from now it can be better determined what is worth while and what the undertaking is.

In most of the textile states there has lately been increased legislation providing for inspection service in the factories and enlarged appropriation for inspectors. This has an indirect relation to the Textile Bureau, as I shall point out later. It has been found, and probably quite generally in your own experience, that inspectors come to visit a factory who have little or no technical knowledge and who, under the letter of the law, demand that there shall be a safeguard placed here or a change made there. Probably the next inspector who is assigned to that district comes with an entirely different idea and wants the thing done in an utterly different way. And that is true even in England, because I corresponded with some of the largest textile machinery builders there, asking them if they could not send me their specifications with respect to the safeguards as required by the British law, where attention has been paid to this for a good while; and the largest of those textile machinery companies replied that they would like very much to comply, but unfortunately they could not, for, notwithstanding the great attention that had been paid to this subject in England, it remained true that every inspector had different ideas and manufacturers were constantly under the misfortune, after having complied with the demand of one inspector, to entirely change the condition to comply with the demand of another inspector whose word was equally autocratic and binding.

In common with a number of the other textile states, there has lately been created in my own state a board to deal with this question, and I happen to have been appointed upon that board as representative of the industries. I told the Commissioner of Labor and Industry that it was proper for him to understand, as I was a member of his official household, that I was advising the textile manufacturers in my district that whenever an inspector demanded that a certain sort of safeguard should be applied or some remedy introduced for a condition that he thought faulty, he should be asked to describe how that should be done; that the Department must be constructive, that it could not be merely critical and faultfinding, and that as this safety program was a perfectly proper one, carried on in a liberal and understanding spirit, it was also perfectly proper, in accordance with modern ideas of government, that the government itself should do constructive work; that it had an advantage which the individual manufacturer could not have; that the inspectors were visiting all kinds of plants, and that problems that seemed insuperable in one plant might have been solved in some others, and that they must bring that whole body of experience to the benefit of the industries of that kind. He agreed with that and the whole question of textile safeguarding in that state was referred to me.

I felt that the best way to go about it was, not to call a general convention of the parties interested, as they did in Great Britain in 1912 and again in 1913 for both the cotton and the woolen industry, and both conventions result in agreeing upon a body of generalities which were of very little use to the individual case. Instead of that we have adopted this plan: We are taking every separate machine required in the textile industry and appointing a committee for that machine, composed of one representative of the mill, the man or the company that buys and operated and is responsible for the machine; one representative of the machinery builder who builds that kind of a machine; one representative of the men in the mill who have to do with the actual operation of the machine.

They are asked to examine and decide what kind of safety provisions are requisite and practicable, and when their report is received it is then submitted to a similar committee of the insurance underwriters insuring textile mills against liability for accident. They are expected to either approve or point out any deficiencies or features which are not satisfactory. With that body of information before them the Industrial Board of the state will adopt that as a standard, and it will then be a matter of information to all the manufacturers as to just what up to this particular time is considered possible and practicable and desirable, and the thing will be sufficiently uniform that it is entirely out of the hands of the deputy inspectors to do otherwise than simply see that that particular thing is provided for.

The point of my reference is this: At the present time the Textile Bureau's activities are and will be until otherwise authorized, restricted to this question of tariff; but your vice-president said yesterday that while the field of these textile associations was such that they ought to be kept separate and each do its allotted task, yet more than ever was it necessary that there should be cooperation between them on points of common interest.

The ballot for new officers on Thursday afternoon resulted as follows:

President—Albert Greene Duncan. Vice-Presidents—William M. Butler, Grosvenor Ely. Directors for three years: Philip Dana, William A. Mitchell, W. Frank Shove. For two years: John Sullivan. For one year: Alexander Makepeace.

The Committee on Resolutions recommended the following resolutions, which were unanimously adopted:

Whereas, under the broad direction of Governor John Winthrop of the Colony of Massachusetts Bay, the cotton textile manufacture was established and fostered by wise legislation in the New England colonies a generation before the processes were known in England; be it

Resolved: That The National Association of Cotton Manufacturers desires to acknowledge most gratefully the able and eloquent address of welcome by His Excellency, David I. Walsh, Governor of the Commonwealth of Massachuchusetts.

Resolved: That in acknowledging our grateful appreciation of the hospitality of the Textile Exhibitors' Association in providing a hall for this meeting, we desire to congratulate them upon the extensive and well-arranged exhibit of textile machinery.

Resolved: That The National Association of Cotton Manufacturers cordially endorses the policy of the United States Department of Commerce in sending special agents to explore the opportunities for American merchandising in foreign countries; and it also commends the Daily Consular and Trade Reports as a means of promptly furnishing valuable information to commercial interests.

Resolved: That The National Association of Cotton Manufacturers recognizes the importance of the census of the manufacturing industries of the United States which the Federal Bureau of the Census to take for the year 1914. The Association recommends to all manufacturers that they cooperate earnestly with the Director of the Census and furnish all of the information required to make the statistics of our domestic manufacture full and accurate.

Resolved: That this Association wishes to express its appreciation of the address of William M. Steuart, Esq., Chief Statistician for Manufactures, Washington, D. C., upon the census of this industry; and it calls attention to the fact that the Colonists of Massachusetts Bay, by one of the earlier acts of its Governor and Assistants, were pioneers in the establishment of industrial statistics applied to the textile industry.

Resolved: That The National Association of Cotton Manufacturers hereby expresses its sincere appreciation of the loyal and most efficient service of its retiring President, Edwin Farnham Greene, whose untiring efforts and wise counsels have done so much for the prosperity, usefulness and permanence of our organization.

The Association also passed resolution of thanks to all non-members who contributed papers at the meeting on invitation by the Board of Government.

At the same session the following new members were admitted:

FOR ACTIVE MEMBERSHIP

Kiyoji Arakawa. Supt. Yenokedzumachi, Nagasaki, Japan; Edward E. Bartlett, Supt. Parker Mills, Warren, R. I.; Henry Newhall Berry, Managing Director Richmond Lace Works, 85 Devonshire St., Boston, Mass.; Morgan Butler, Treas. Butler Mill, New Bedford, Mass.; Luther Dana, Supt. Dana Warp Mills, 55 Strondwater St., Westbrook, Me.; John J. Dinneen, Supt. La Tosca Yarn Mill, 25 Park Ave., Utica, N. Y.; O. D. Frost, Gen. Mgr. Champlain Silk Mills, Whitehall, N. Y.; Eugene C. Gwaltney, Gen. Supt. Marlboro Cotton Mills, McColl, S. C.; Harry Edward Houghton, Supt. Dwight Mfg. Co., Chicopee, Mass.; Herbert H. Marble, Treas. Arkwright Mills, Fall River, Mass.; John F. Miller, Supt. Silver Lake Co., 48 Churchill Ave., Newtonville, Mass.; Ephraim E. Orrell, Agt. and Gen. Mgr. Barnaby Mfg. Co., Fall River, Mass.; John A. Pearson, Sec. The Esmond Mills, Esmond, R. I.; William A. Pedler, Supt. Arlington Mills, Cotton Dept., 174 Broadway, Methuen, Mass.; William D. Phillips, Supt. Naumkeag Steam Cotton Co., 3 Holly St., Salem, Mass.; John D. Street, Mfg. Expert, Eddystone Mfg. Co., 72 Leonard St., New York City; Gilbert Thornton Thompson, Treas. Gosnold Mills Co., 191 Hawthorn St., New Bedford, Mass.; Henry F. Williamson, Mgr. American Net and Twine Co., Blue Mountain, Ala.

FOR ASSOCIATE MEMBERSHIP

Walwin Barr, Mgr. Styling and Adv. Depts., Renfrew Mfg. Co., 35 Thomas St., New York City; E. Howard Bennett, Pub. American Wool and Cotton Reporter, 530 Atlantic Ave., Boston, Mass.; Charles L. Gagnebin, Vice-Pres. Farbnerke-Hoechst Co., 140 Oliver St., Boston, Mass.; Gurry E. Hugerns, Treas. The Parish Co., 110 Worth St., New York, N. Y.; Louis Joseph Matos, Ph. D., Chemical Engineer Casella Color Co., 182 Front St., New York City; John S. Merchant, Standard Mills Supply Co., Providence, R. I.

Much credit is due to the Committee on Meetings for the completeness of the arrangement and very efficient manner in which the program was carried out. This committee was composed of the following members:

The Committee on Meetings, having general charge of the sessions, consists of Messrs. Charles H. Fish, Boston, Mass., Chairman; Joseph D. Aiken, Taftville, Conn.; Frederick H. Bishop, Boston, Mass.; Robert William Boys, Killingly, Conn.; Arthur C. Freeman, Lawrence, Mass.; Luther G. Goodrich, Boston, Mass.; Churchill Hungerford, Philadelphia, Pa.; Fred Lacy, Lowell, Mass.; Charles R. Marvin, Lewiston, Me.; William C. Plunkett, Adams, Mass., and Albert L. Scott, Boston, Mass.

At the last session on Thursday, Charles C. Phelps, of New York, read an interesting paper on "Compressed Air in Cotton Mills,"

which was illustrated with a large number of photographs. The other papers presented at the various sessions are as follows:

WHY DOES THE FEDERAL GOVERNMENT TAKE A CENSUS OF COTTON MANUFACTURES FOR 1914?

BY WILLIAM M. STEUART
Chief Statistician for Manufactures, U. S. Census Bureau, Washington

The Federal Government now prepares each year an estimate of the acreage planted in cotton. It follows the growth of the plant, showing the weather and other conditions attending its development, fostering it by determining the best methods of cultivation, and destroying its parasites. It publishes estimates of the annual production considerably in advance of the complete marketing of the crop, shows the rapidity with which the crop

WILLIAM M. STEUART

is ginned and with which it enters commercial channels, its consumption in manufactures, its exportation, and stocks on hand.

For no other industry are there such complete current statistics collected, and for this distinction three reasons may be mentioned.

1. The importance of cotton in our agricultural, manufacturing and commercial operations.

2. The localization of the industry, which, in a measure, centralizes the effort to secure governmental assistance.

3. The fact that the methods followed in the handling of cotton are most convenient for statistical enumeration.

Before the establishment of this elaborate machinery of the government for collecting data regarding cotton there was no definite knowledge of the conditions surrounding the development of the crop, of its size, or of other matters essential to the fixing of prices. The prices were, at times, determined largely by manipulation and rumors promulgated by persons who took advantage of the rise or fall thus produced without purchasing a pound of cotton. While transactions are still carried on to take advantage of marginal changes in prices, the positive information of actual conditions has gone far toward eliminating the sharp practices that formerly frequently characterized dealings in this commodity.

The possibility of manipulating the price of cotton so as to create fictitious values was appreciated in the early history of the industry. The desirability of exact information to protect the interests of legitimate sellers and purchasers was shown when Congress in 1831 passed a resolution instructing Levi Woodbury, Secretary of the Treasury, to collect and compile data regarding the production and consumption of cotton throughout the world, and Mr. Woodbury's report, transmitted to Congress in 1836, is yet referred to as a most complete statement of the subject. While the government has compiled data regarding some phases of the cotton situation such as exports ever since its establishment, it is only within very recent years that its activities have become so comprehensive. The magnitude of the work now being done by the Census Bureau in collecting statistics of cotton is indicated by the following: The crop of 1912 was ginned in 25,279 establishments. The government collects, by the employment of 750 agents, signed reports from all of these establishments showing the total quantity ginned up to ten specified dates during the ginning season; also reports from 2,100 cotton consuming establishments, and from 2,500 warehouses and other public storage places showing the quantity consumed each month and the stocks on hand at the end of each month. These reports are all assembled and the results made public within a few days after the date to which they relate. This service costs about $250,000 per annum. There are no estimates involved in the process, and the results are an actual record of current transactions. In magnitude, accuracy and rapidity of compilation this work far surpasses any other single piece of industrial statistical service done by this or any other government or by private enterprise.

Before the establishment of the census ginning and consumption and stock reports, statistics regarding the movement of cotton were compiled by individual enterprise, and showed only the receipts at selected interior points, and at ports and mill takings. At best these reports were incomplete statements of the situation and in some instances were misleading. Such a condition not only permitted but rather encouraged the manipulation of prices. Cotton as a rule goes directly from the ginnery into commerce, and statistics showing receipts at certain points can cover only the portion of the cotton that has reached those points. The cotton commercial year begins September 1, and the statistics compiled by the New Orleans

Cotton Exchange show that to and including January 30, 1914, 11,512,959 bales had come into sight, that is had arrived at ports, selected interior points, etc. Such a total was of great value before more reliable statistics were available, but it loses a great deal of its significance when the government precedes it with a report showing that up to the close of business on the 15th of January, 13,589,171 bales of cotton had been ginned. Practically all of this had been disposed of by the grower or original owner and was on the move toward its final destination. In a sense it had all entered commercial channels, and this fact justifies the assertion that the quantity of cotton ginned is the only accurate measure of the rapidity with which a crop is entering the market.

The statistics of ginnings have now been published for a number of years, and they are referred to by the press as coming out with "deadly accuracy." They show that by October 18 about one-half the crop is usually ginned. The actual proportions during recent years range from 38 per cent. in 1906 to 54.9 per cent. in 1909.

The supply of cotton in the United States during the commercial year ending August 31, 1913, amounted to 16,225,734 bales and included 1,776,885 bales carried over from the preceding year, and 225,460 bales of foreign cotton imported. Of the total supply, 35.9 per cent. was consumed in the United States, 54.2 per cent. exported, and 9.9 per cent. was on hand in domestic warehouses, factories, etc., at the close of the year.

In view of this abundance of current statistics concerning the production and consumption of cotton, the inquiry is constantly made: "Why does the Federal Government take a census of cotton manufactures every fifth year?" This inquiry is generally accompanied with the statement: "We are now overburdened with city, state and general government requests for statistics and other information concerning our business. It does seem that a decennial census is sufficient."

The question could be answered by the statement that the Act of Congress approved March 6, 1902, directs "that in the year 1905, and every ten years thereafter, there shall be a collection of the statistics of manufacture, confined to manufacturing establishments conducted under what is known as the factory system, exclusive of the so-called neighborhood and mechanical industries." The Acts of March 3, 1899 and July 2, 1909, provide for the regular decennial census of manufactures.

Cotton manufacture is but one of a great many that make up our industries. In order to cover the entire field, it is necessary to collect uniform statistics for all. The legislation was enacted in response to an urgent demand for more eloquent reports on the condition of our manufactures. It was contended that the decennial censuses had, as a rule, covered prosperous years and were not true statements of actual conditions, and that an enumeration every fifth year would be more apt to reflect normal conditions. While it would require an annual report to show actual conditions, the five-year census, nevertheless, is a fairly accurate measure of the industrial growth of the country.

Detailed statistics for the various industries are collected by the use of supplemental schedules. In the cotton industry there are single companies that manufacture considerable proportions of a certain kind of cotton goods such as ducks, ginghams, or lace goods. Establishments making a specialty of a certain kind of fabric use the census figures as one of the factors to determine whether they should increase or decrease their annual production. In fact, the president of one of the most important manufacturing corporations of the country, at a conference in New York City, stated that statistics showing the total quantity of certain commodities manufactured annually were of great assistance to him because they enabled him to determine whether or not he was getting his share of the total consumption.

It is probable that no other single crop furnishes a livelihood to so large a proportion of the population as does cotton. It is grown on about 2,000,000 farms, ginned in about 25,000 ginneries, located in approximately 900 counties in seventeen states, and it is used to a greater or lesser extent in the manufacturing activities of every state in the Union. After leaving the ginnery a large part of the cotton goes to the 2,500 public storage places, and then to the factories and ports.

Estimating that the planting, cultivation and harvesting of cotton gives constant employment on the average for the entire year to at least two persons on every farm where it is cultivated; that each ginnery gives employment on the average to four persons; that there are on the average three persons employed in every warehouse or public storage place; employment is given to more than 4,100,000 persons. In addition there are about 30,000 persons employed in the cotton seed oil mills, 388,000 in the cotton mills, and 135,000 in hosiery and knit goods factories. Considering that 10 per cent. of the employes in woolen and worsted mills are engaged in the use of cotton and its manufacture, a further number of 20,000 is provided with employment, which gives a total of nearly 4,700,000 persons.

In addition, cotton is used as the principal material in several thousand other establishments in the manufacture of bats, felt, mattresses, bedding, absorbent cotton, and a number of other products. These necessarily give employment to a large number of people. During the picking season employment is given to a large number of persons not actually engaged on this crop during the period of cultivation. There is also an army of buyers scattered throughout the cotton belt to purchase cotton as it comes on the market. Probably as much as 90 per cent. of the total crop is compressed, and this requires the services of a large number of people. To move a 15,000,000-bale crop requires at least 300,000 freight cars as well as a large number of vessels.

It thus appears that the number of persons actually engaged in the growing, handling and manufacture of cotton in the United States approaches 6,000,000, while the number dependent upon it for a livelihood is much larger. It is important that we have definite current information as to the condition of an industry in which such numbers are employed, and which in addition fur-

nishes an important part of the clothing and household articles for our entire population.

The Federal and State Governments expend annually large amounts in fostering the production of cotton. Laws affecting it are constantly being enacted, and for both of these purposes it is necessary to consult census statistics concerning the various branches of the industry.

In addition to showing the magnitude and condition of the industry, together with many facts that are essenial to the guidance of the legislator and manufacturer, the census reports contain information bearing on many features of social and economic conditions. For example: There were, in 1909, 1,042 cotton mills operated by corporations. It is presumed that each of these companies has a record showing the number of persons owning its capital stock, but such information is just as important to the nation as a whole as it is to the separate establishments. The census reports show that the capital stock of these corporations was held by 126,190 individuals, companies, trustees, etc. There is, of course, some duplication in this number, due to the holding of stock in more than one company by some individuals.

While it is impossible to determine the effect of the different factors that have aided in this wide distribution of the capitalization of cotton mills, it is, of course, dependent largely upon the amount of capital, the number of shares, and the effort that has been made to distribute the stock rather than to centralize its ownership. Still a comparison of the figures reported for the different states is interesting. The 145 corporations in Massachusetts reported 38,009 stockholders, or an average of 262 to each company. The 37 companies in Connecticut reported 11,507 stockholders, or 311 per company. The 262 corporations in North Carolina reported 11,371 stockholders, or about 43 to each company; the 144 in South Carolina, 16,148 stockholders, or 112 per company; while the 107 in Georgia reported only 8,571 stockholders, or 80 per company. On the other hand, the average capital per company in Massachusetts was $1,895,208 and in Connecticut $1,017,860, as compared with an average of $300,102 for North Carolina, $809,876 in South Carolina, and $492,207 in Georgia.

I have referred only briefly to a few of the uses made of census data. Possibly the most important is that in connection with the enactment of legislation. The figures show the importance of the industries to be affected, the number of persons dependent upon them for a livelihood and other features that should be considered before changing existing laws or enacting new ones. Notwithstanding the importance of the statistics, there is some disposition to consider census reports a nuisance, and their preparation an irksome duty imposed by law and one to be performed with the least degree of inconvenience and with slight regard to accuracy. In the endeavor to overcome any latent opposition that may exist to the collection of the statistics and to emphasize the importance of such information, the Director of the Census has been conferring with associations of manufacturers, boards of trade, chambers of commerce, and other organizations interested in our industrial development. This is a new departure in census work, and it is undertaken not only for the purpose of securing the cooperation of manufacturers, but for obtaining from them suggestions of such inquiries as will in their opinion develop statistics of the greatest value; also for recommendations concerning the best methods to be followed in the collection, compilation and publication of the data.

Heretofore two blanks have been used in taking the census. One, known as the "General" schedule, is used to collect the statistics concerning capital, employes, wages, etc., that are common to all establishments, irrespective of the industry in which they are engaged; the other, known as the "Supplemental" schedule, seeks statistics concerning the quantity and cost of the different materials used and the quantity and value of the principal products. The following tables give the principal materials used and products manufactured in cotton mills.

Every large manufacturer should have at his command current statistics of the quantity of his specialties manufactured in the United States, as well as the quantities imported and exported. The Department of Commerce furnishes such information, and, by taking a census every fifth year, it is endeavoring to give, at more frequent intervals, data that will reflect more accurately the condition of the industries of the country.

At the census of 1910 some of the largest cotton manufacturers stated that it was impossible for them to furnish the details required by the census blank. Their records were not kept in such a way as to enable them to ascertain, for example, separate values for plain cloths for printing or converting; brown or bleached sheetings and shirtings; twills and sateens; fancy woven fabrics. Therefore, they gave the total quantity and value for this group of products, although the blank called for separate figures for each. The majority of the companies manufacturing these products furnished separate totals, and, in order to give the aggregate for the United States, the census officials had to estimate a segregation of the totals for those companies who failed to furnish it. The preparation of such estimates is very unsatisfactory, and the officials of the Bureau regret the necessity of resorting to them. To overcome this we are now appealing to the manufacturers to tell us if the inquiries on the schedules are not practicable. We would much rather have strenuous opposition to the inquiries than a quiescent attitude, and then, after the government has spent large sums for printing, clerk hire, and other matters, find that the inquiries cannot be answered by any considerable number of establishments. We feel that there has been too much of a disposition among census officials to decide upon a series of inquiries without consulting the persons who must furnish the answers. It has not only caused unnecessary financial loss to the government, but has greatly retarded the publication of the census reports.

Census reports must be prepared quickly. It is impossible to send agents to every factory to spend days in copying from records the data called for by the inquiries. Such a process, if pre-

ferred by the manufacturers, would retard the work indefinitely; therefore, the inquiries must be such as can be readily answered by all, or practically all establishments.

While this policy of appealing to manufacturers for suggestions concerning the inquiries to be included in the census schedule is meeting with general approval, we have not received the criticisms which, I think, should now be made by manufacturers who, later, will perhaps contend that they cannot give the data called for. The majority of the suggestions have tended to increase the amount of detail to be collected. For example, it is recommended that statistics be collected showing the quantity of the different grades of cotton consumed, the classification showing:

Quantity less than ¾ inch in length,
Quantity from ¾ inch to 1 inch,
Quantity from 1 inch to 1¼ inches,
Quantity from 1¼ to 1½ inches,
Quantity exceeding 1½ inches.

This suggestion has been made by those who are especially interested in the quantity of the different grades of cotton consumed annually, and also by the officials of the Bureau of Plant Industry of the Department of Agriculture where they are establishing the grades of cotton. But if it is impossible for all, or for a majority, of the manufacturers to furnish such details, certainly the inquiry should not be carried on a census blank that must be filled by all manufacturers. The same is true of the following suggestions:

That information regarding the hour operation of spindles be obtained. This is desired so that the operations of all mills may be made on the same basis. Some spindles are now operated both day and night, while others are operated only during the day. In some states a week consists of sixty or more hours, while in others a week consists of fifty-four hours. Because of these differences in the time during which the spindles are operated, information on a uniform basis would permit of the arriving at conclusions of greater value.

That sea-island cotton be shown separately under materials.

That space be provided to indicate the kind of foreign cotton consumed.

That information regarding the cotton operatives, whether native or foreign-born, and whether illiterate, be collected.

That more information be collected regarding bleaching, dyeing, and printing, including information as to the number of printing machines under this heading.

That information be collected as to the quantity of cloth printed and converted.

That the classification of looms be changed, as the same loom may be used in weaving cloth of different widths during the year, and, for this reason, it is impossible to give exact information.

That the division of duck be made "double filling" and "single filling" instead of "sail" and "other," as at the census of 1909.

It has been the practice for the census to have the different fabrics reported in square yards, because a total of running yards in different widths would have no significance. Some manufacturers now contend that running yards or the weight in pounds should be reported and not the square yards.

Some contend that the census schedules should be simplified and at the same time make suggestions for its enlargement.

The present administration of the Census Bureau does not want to unnecessarily burden the manufacturers with inquiries seeking unimportant details. It comes to you frankly for advice in this important matter. The census affects manufacturers directly, and we desire to do the work in a manner that will cause you the least inconvenience and at the same time secure the statistics which you think are of the greatest value. I am here for the purpose of discussing the entire subject, and hope you will take the opportunity of stating your objections, if you have any, to the census inquiries. I assure you that we shall endeavor to formulate the schedules so they will be acceptable to you, but it must be realized that census blanks are applied to all establishments, large and small. Therefore, the inquiries must be of such character that they can be answered by all; and permit of results which will be comparable with those for prior censuses.

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THE EXPORT SIDE OF THE TEXTILE INDUSTRY

BY JOHN F. FITZGERALD

Chairman Foreign Trade Committee, Boston Chamber of Commerce, 200 Devonshire St., Boston, Mass.

I am not a cotton manufacturer, but having given some study to the exports of the various textiles, especially cotton, I believe that your industry shows a marked development in foreign trade. It is with our common interest, therefore, of cooperating along the lines of foreign trade that I have consented to review in this regard certain aspects, especially of your business.

First of all, please rest assured that your industry is far too complex for me to undertake to tell you how to run it. What I do wish to do, is to interest you personally in this problem of foreign markets. Even though at present you have had pressure brought to bear upon you in this regard, and perhaps export considerable, nevertheless you, personally, have largely shifted the study of this foreign problem upon your sales agency, so many other problems have seemed more important to you for the time being. Let us, then, look at this problem man to man, leaving all our intermediaries out of the question.

For the year 1913, two hundred and seventy-seven textile mills were built, this being about the average number. In the cotton industry there were 332,760 new spindles, a decrease from the previous year, but when considering the extent of our home markets, quite an excessive yearly growth. This growth did not embrace many new mills, but improvements and additions to old mills.

COMPARISONS OF SPINDLES IN NEW COTTON MILLS

1913	1912	1910	1909	1908	1907
New England					
75,000	94,400	468,714	599,000	115,000	113,000
Southern States					
250,760	437,000	214,028	527,528	91,193	294,745
Middle and Western States					
7,000	1,700	12,500	79,968	3,500	10,250

These figures show that our recent rate of growth has been considerably more than our home market requires. In the recent tariff investigation it was shown conclusively that the manufacturers of the United States could supply the home market on 65 per cent. production. This leaves 35 per cent. as a curtailment of production, causing the shutting down and throwing out of work your employes, or for the development of your export sales.

Our cotton mills are practically located on the ocean, and especially in the New England district are provided with good ports for export. The sea, in the early days of the industry, meant much to the Yankee manufacturers. Their clipper ships carried cotton goods which were bartered to the natives in the leading ports of Africa and Asia. In the Orient, a white man was first asked if he was an Englishman. If not an Englishman, he was a Boston man. Our brands won their way in competition with the other traders of the world, and even today many of these old brands are still known to the natives and stand for a high grade of product, commanding a higher price.

Today the New England section, strictly speaking, is not the export section that it formerly was. As one manufacturer expressed it, the export trade has been legislated out of New England. The south today, with its supremacy in manufacturing unbleached goods containing a large amount of cotton with a small labor cost, has a large percentage of our exports. Most of her mills have been direct growths of the old New England mills formerly exporting these coarser grades of cotton goods. There is little doubt in the minds of all manufacturers that we can lead the world in manufacturing this particular line, but the New England section having had most of this particular branch of the industry taken away from it, feels especially the difficulty of solving the future of her exports. Whether we are protectionists or free traders, there is little doubt that New England again will ever enjoy as complete a protective tariff as under the recent Dingley or Paine-Aldrich acts. At present, and with fairly good assurance, she does not fear the flood of the home market with European goods in the better grades of cotton cloths. She will, no doubt, lose ultimately several established lines, but she will be able to hold the greater part of the home market. Her problems will be:

First, To meet the increased cost of present legislation as compared with other sections of the country, especially due to various forms of workingmen's compensation, and other wage laws.

Second, To increase the efficiency of her plants capitalized on the sound basis of cost.

Even today, although New England has felt this pressure, she has been able to export with increasing quantities these higher grade goods to various countries of the world, and there is no reason to believe that with her already efficient organization she will not be able to develop her labor so that they may have a greater degree of skill and be able to produce on a basis more and more favorable to meet the English and foreign manufacturers on export fields.

Last year we exported $1,185,000,000 worth of manufactured goods, comprising 46 1/10 per cent. of our total exports as compared with $121,000,000 worth in 1880, composing only 14 78/100 per cent. of the exports. From a general survey for 1913, the Government synopsis states that—"The growth in exportations of manufactures of cotton has not kept pace with that in many other classes, especially iron, steel, lumber, copper and mineral oils."

In 1913 our total exports of cotton manufactures was 466,677,252 yards, valued at $53,750,000, which showed a slight increase over 1912. In 1913 we exported $4,589,896 worth of woolen manufactures and $2,284,896 worth of silk manufactures. The world's trade in cotton manufactures approximates $600,000,000. Of this amount the United Kingdom supplies about $600,000,000; Germany is second with $136,000,000; France is third with $75,000,000, and the United States is fourth. Although we produce two-thirds of the raw cotton of the world, we supply only one-sixth of the cotton manufactures. The Orient is the world's chief market for cotton goods, Asia importing about $350,000,000 worth annually, $200,000,000 worth being taken by India and about $100,000,000 by China. Europe takes about $250,000,000 worth; North America $125,000,000 worth; South America $75,000,000 worth, and Oceania and Africa each about $35,000,000 worth, these figures being approximations from the last available figures in the various countries.

Of the $100,000,000 for China, our share was $8,000,000, whereas in 1905 we sold, after the Russo-Japanese war, $33,500,000 worth to China. Our share in the India trade for last year was $1,000,000. Our balance of excess of imports of cotton manufactures over exports is $10,000,000, which is a considerable improvement over thirty years ago when the excess was $21,000,000. The principal markets for our exports were Philippine Islands, China, Canada, West Indies, Central America, Red Sea district and East Africa. Let us look briefly at each one of these markets.

The exports to China increased over 1912, but Japan has had constantly a greater share of this market because she is more favorably located and can, through various channels, more readily get her goods into China, but her great growth has been largely due to the development of her sales agents.

Russia has also absorbed through her activity, a large share of the Chinese market, but with our economic supremacy in production of gray goods, we, with improved method of sales, should be able to meet this Japanese competition, especially when we consider what a great handicap Japan has with her limited capital. After all, it is their activity in pushing sales and studying the con-

stantly changing conditions of the country which makes them able to respond more quickly than we do. Although the Chinese have suffered by having their coinage debased to one-half its former purchasing power, with no increase in wages, the Chinese market, nevertheless, offers a constantly increasing demand for cotton goods, this demand being helped by the modern spirit prevailing from the government down to the coolie laborer. Furthermore, our goods are of a much better quality than those from Japan, and our brands have been recognized for years there.

Our export trade to the Philippine Islands was one of our brightest spots last year, having sent them $5,848,400 worth of cottons, an increase of about $600,000 over 1912. Of course, we have been able to increase there largely because of the fact that the Philippine tariff has given us a slight preference over other countries. Nevertheless, our growth will have to be enormously increased before we can outsell England, who today sells her, roughly, twice as much as we do.

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EFFICIENCY AND COST OF DOING BUSINESS

BY JOHN S. LAWRENCE

Lawrence & Co., 89 Franklin St., Boston, Mass.

There are many reasons why I am glad to address you today to discuss some vital problems of mutual interest, and try to indicate how some may be solved.

Publicity, and investigations by the public for the public, are growing in popularity. These have unearthed inefficiencies of system and officials in so many corporations, even among those who were thought the standard of perfection, that this policy is bound to spread and bring about investigations of our problems, which will create new laws if those in effect at present do not seem to properly protect the public interest—in fact, hearings on this subject are now being held in Washington. Public service and larger corporations have naturally been the first to be criticised, and the opportunity offered to prepare for the splendid business that must come to a young and vigorous country, such as ours, should be welcome.

The functions of stock carrying, service, local acquaintance and credit are necessary to any nationally distributed line of goods, and if efficiently conducted, must be profitable. In these days of quick turnover those who have stock ready to deliver enjoy great advantages.

When the School of Business Administration of Harvard University was started, little more than theories were found from which to teach. Production was fairly well standardized and many efficient people were engaged in work on the subject; administration was in the hands of able thinkers, but little study had been made of distribution. The question then arose. Why not analyze distribution as well as psychology and physiology?

A simple line was chosen on which to begin work—Shoes. Teachers and students went into the field, covering Ohio and Wisconsin. The conclusion of the first period disclosed little that was of value. To quote from the school's first report on this work: "Practically no two retailers kept their accounts in the same way; many kept insufficient accounts. Some, for example, reckoned the profits on the cost, and some on the selling price. Some charged salary for their own time and rent for their own stores, while others did not. Some meant one thing by selling expense and some meant another. The need of a common basis of comparison, a common measure, was clearly seen."

An advisory committee was formed to create a proper accounting system, blanks were printed, and the next year teachers and students set about introducing this system. It was adopted by one hundred and fifty retail stores who report semi-annually to the University. In return they receive totals of these reports reduced to averages, with advice and suggestions for the conduct of their own businesses.

We have entered on the third year of the work. Six hundred and fifty-two concerns, as against one hundred and fifty last year, are now submitting semi-annual reports. One hundred and twenty-three manufacturers and forty-seven wholesalers have endorsed this system and recommended it for their retail customers, while a few have adopted it with slight modifications for their own use. So many have requested blanks that these have run out of print, but if any if you desire a copy of the next edition, it will be mailed to you on receipt of fifty cents, which may be sent to the School of Business Administration, Harvard University, Cambridge, Mass.

Work such as illustrated by the table referred to is possible only when handled broadly by a disinterested third party, and I assure you that no member of the advisory committee has access to any more information than the averages which are published to all contributors. Some may feel that these teachers and students are of little practical value to the business man, yet a glance at the correspondence and testimonials from those who have profited by the work will dispel this idea.

Information from shoe wholesalers is now in process of collection, and we trust at some future day that textiles may be similarly treated. This work is being followed by leading universities and especially by the Department of Commerce at Washington.

Those of you who have not seen the product of the Department of Research of the Curtis Publishing Company, the Root Newspaper Association, or of System Magazine of Chicago, should lose no time in doing so. This research work shows that costs of middlemen tend to decrease as volume of business increases up to a certain point; beyond that point, varying according to locality and character of goods handled, costs tend to increase.

I am anxious to discuss three phases of the wholesale problem:

First—The advantages to the wholesaler of modern accounting, or, as it is sometimes called, "fact finding."

Second—The temptation to overdo private branding.

Third—The better education of sales organizations.

First. Buying expense, salaries, traveling, advertising, delivery, rent, interest, freight, warehousing, insurance, depreciation and bad debts

can readily be kept separate, for the business as a whole or even as applied to departments, which are logically defined according to the character of the goods handled. Then each department can easily be analyzed on its own merits, so that by judicious combination of separate costs any sales may be readily analyzed in detail in such a way as would indicate the net profit of the transaction. Special test cases might well be thus analyzed, as is the practice in many factories.

I believe interesting information may be gained by those who thus study their business. The difference between gross and net profits of the various classes of goods and the various lines offered by different manufacturers would show some remarkable comparisons, and indicate the way to effect economies which today may not be thoroughly realized.

Such a system might show interesting contrasts between large volume of orders at low gross profit over lesser volume at greater profit. It might also show that a general overhead charge tends to increase the business that costs most to get and decrease that which is most easily reached; that direct shipment from mill to dealer saves freight, rehandling and warehousing, thereby permitting lower prices and greater real profit. It would be interesting to see laboratory tests of costs of securing business by salesmen, advertising and circularizing, in comparison of costs to sales.

A system of accounting which produces the real facts simplifies the work of the chief executive by thoroughly posting his department managers, for it enables each to more intelligently operate his department. It develops new ideas of service and such a cost system should, and I believe can be made to work automatically for or against department profits in real relation to their actual cost.

Second. Due to the very serious competition among wholesalers some twenty years ago, the idea of private branding merchandise was evolved. Price cutting and ruinous competition was avoided, credits improved and the industry prospered. Goods disguised under private tickets and markings were less directly competitive than was the case when they were all under one mill brand.

There may develop dangers to this situation. There is a temptation to overdo a good thing; luxuries and unreasonable sales energy, advertising, traveling, commission, etc., may make it unprofitable to offer quality equal to the mill brand, with the resulting temptation to reduce the quality of goods. Thus we reach the problem of

High Quality + Small Sales Energy
vs.
Lower Quality + Greater Sales Energy

and the extremes of one are as disastrous as those of the other.

Third. Little is being done to educate the dry goods salesman. The older men have their methods of doing business, and the younger men are turned loose to pick up what they can and to accustom themselves to being told "No goods wanted today." If you want a typewriter, a salesman is sent who knows the entire construction and operation of his and competitive machines, having been trained in the factory. An efficient school for the education of its salesmen is maintained by the National Cash Register Company of Dayton, O. The Dennison Manufacturing Company requires each salesman to spend twenty per cent. of his time at the factory.

I appreciate the difficulty of educating a general salesman as to all the merchandise he carries; this would probably have to be done to a great extent by correspondence, posting him as to the selling points of his merchandise. The bulk of these selling points must be prepared and vouched for by the manufacturer of the goods. Is it not possible for salesmen to come in closer touch with the manufacturer and become better posted on the articles they sell, so as to make it less necessary to employ specialty men who must of necessity add to the selling cost?

A general salesman may argue that certain goods are desirable because of their brilliant luster, while a factory-trained salesman might show that extreme luster weakens the fabric. Would it be feasible for the salesman, when at headquarters, to receive direct education from the manufacturers of the merchandise they sell—such a condition should be welcomed by both manufacturer and wholesaler as beneficial to each.

It would be profitable to hear thoroughly discussed what effect, if any, cost systems, private branding, and education of salesmen on the part of the wholesaler and retailer have on the growth of systems of more direct selling.

I trust the few remarks I have made come at an opportune time. The past year has been one of lean profits to many; some are being pushed to take unusually radical steps by those who know less of our business than we. Times like the present reveal flaws in systems which heretofore worked successfully. Individuals must adapt themselves to new conditions or the conditions will create new individuals.

With the stimulus of necessity caused by lack of profit, publicity and the clamor against the high cost of distribution, let us work closer together, that the manufacturer may not invade the territory of the distributor nor the distributor that of the manufacturer. There is need for both—neither trying to be other than what he really is—the efficient manufacturer and the efficient distributor, cooperating for the good of each and that of the community which they serve.

ELECTRIC POWER CONTRACTS

BY PROF. WILLIAM L. PUFFER
Electrical Engineer, 201 Devonshire St., Boston, Mass.

Whenever it appears desirable for a manufacturer to compare the probable cost of producing his own power as against the purchase of it from some service corporation, he finds immediately that there is great difficulty, due to a complete want of understanding by the purchaser of the terms used by the seller; in short, the contract agent begins to talk in what is substantially a foreign language and it is to be feared that in some cases explanations are purposely avoided.

Trouble and misunderstanding always appear when a seller is obliged to use terms and words not clearly understood by the buyer, and it is practically impossible to talk even the simplest electrical matters without making use of technical

expressions, and when it is necessary to discuss the complications of the fluctuations of a mill load and the proper rates suitable to such conditions the average keen business man is soon beyond his depth.

It naturally happens that the electric company having repeated demands for some sort of a contract form of selling power will soon draw up a "standard power contract" which will embody all of the things which experience has shown to be desirable from the point of view of the company. Many of these contract forms have fine print "regulations" or "conditions," which are hereby made

WILLIAM L. PUFFER

a part of this agreement" and which must be examined very carefully to find the effect they have on the apparent meaning of the main contract.

These "conditions" refer generally to matters unknown to the purchaser and do not from their phraseology seem to refer to any material thing concerning the trade which is being made.

One of the earliest inquiries during the preliminaries of a power contract will be "how many horse power will the mill require?" Generally speaking, there is no great difficulty in arriving at some idea of this quantity either from a skilled study of proper indicator cards or the known requirements of new machinery. It must be remembered that this is merely a statement of the largest ordinary amount of power it will take to run the mill and is liable to considerable error and is also in a way a sort of average estimate.

Next in order will be the necessity of estimating the probable amount of time in the year that the assumed horse power will be used. The answer will be found in the number of hours the plant will operate in a year of 3,000, 2,800 or 2,500 hours of full time. The result should be expressed in horse power hours and may or may not include a proper allowance for overtime, night work, short hours and partial time, but it is a correct and definite way of stating the actual requirements for a working year.

The words "horse power year" constitute a very common expression often used in an endeavor to give definiteness to a statement of the requirements of a mill, but probably no two people will give the same exact statement of the meaning of the term, as can be seen by the examination of several definitions that can be made up. A horse power year might be,—

Definition No. 1. Exactly one horse power steadily day and night throughout the year, or 1 h. p. × 365 days × 24 hours equals 8,760 hours' use of exactly one horse power.

Definition No. 2. Exactly one horse power steadily day and night throughout the year except Sundays and, say, three holidays, or 1 h. p. × 310 days × 24 hours equals 7,440 hours' use of exactly one horse power.

Definition No. 3. Exactly one horse power steadily for a ten-hour day for every day in the year, or 1 h. p. × 365 days × 10 hours equals 3,650 hours' use of exactly one horse power.

Definition No. 4. Exactly one horse power steadily for a ten-hour day except Sundays and, say, three holidays, or 1 h. p. × 310 days × 10 hours equals 3,100 hours' use of exactly one horse power.

Definition No. 5. Exactly one horse power steadily for an eight-hour day excepting Sundays and, say, three holidays, or 1 h. p. × 310 days × 8 hours equals 2,480 hours' use of exactly one horse power.

In place of the perfectly steady load assumed in the previous definitions we could assume that the load would fluctuate by exactly the same amount (say 10 per cent.) above and below the exact one horse power and that the fluctuations lasted relatively short time. In this case the total horse power hours in any given definition of a year would correspond exactly with the previous examples and the average horse power would be just one. If the driving power were limited to exactly one horse power this average horse power could not be operated and it would be necessary to be certain of one and one-tenth horse power, that is, the available capacity would have to be 10 per cent. larger in order to carry the average horse power.

Now consider a load which never exceeds one horse power, but due to the necessary time required to stop some machine or process, the full horse power is not required all of the time. This is probably more nearly the average man's idea of a horse power year, and it is exceedingly indefinite because of the unknown amount and time the load falls off, and to this uncertainty is added the question of hours' use per year as raised in the first examples. It takes but a moment's thought to show the glaring uncertainty as to the exact number of horse power actually required or taken to make up a horse power year. As a matter of fact, there are a very few power users who know exactly how many horse power they require, or even vaguely estimate the number of horse power hours they use in a year.

In order to deal with these uncertainties it will be necessary to introduce two ideas and to assign names to them. The first is "demand" and it will be taken to mean the highest number of horse power required at any one of the several times when the load for any reason temporarily or momentarily increases. In other words, it is the size of the theoretical engine which could just carry the maximum load and the slightest increase would cause it to shut down, or in fewer words, it is the greatest amount of power ever required at any time.

The name of the other idea is "load factor," meaning a number representing the percentage which the total horse power used in a given time, such as a day, month or year, is of the total horse power hours that would have been used had the power been used steadily at the maximum rate used at any moment during the time.

Combining the two ideas, we would say that the "demand" is the greatest use of power at any time and the "load factor" is the percentage which the actual horse power hours are to what they would have been if the "demand" had been used continuously or in other words, the load factor is the percentage the average load is of the maximum.

Unfortunately "load factor" has been used in connection with the day of eight, ten or twenty-four hours, a month or a year of different number of hours, consequently the term is dangerous in a contract unless very carefully defined. The writer has never yet been present at a conference or attempt to fix a price without there being a misunderstanding as to why a "mill horse power year" was not exceeding definite and as positive as "kilowatts used in a year."

The reason why this is so, can be found in the fact that no engineer in charge of a steam engine has the means of measuring the actual number of horse power hours his engine has developed. The best he can do is to take indicator cards at times assumed to represent the average load and then try to estimate or guess the number of hours the load will be or has been used, and even then he has no idea of the under load runs and the runs at odd times. On the other hand, the electrical engineer has many simple and accurate methods and instruments which clearly show by charts, dials or pointers any or all of the desired results.

The electrical terms kilowatt and kilowatt hour are now generally used in place of horse power and horse power hour, the electrical unit being almost exactly one-third larger.

Nearly all power prices are made up of the demand and the load factor charges, in a contract or rate sheet they are indicated by such expressions as "meter," "demand," "service," "readiness to serve," "primary," "first twenty-four hours' use of the demand" and special prices for the first given block of power, etc.

This charge is based upon the assumption that there must be a certain part of the whole generating plant assigned to the use of the customer all of the time and that it cannot safely be used to serve any other demand, and that there is a certain part of the lines, transformers, meters and the like usable only by the customer. This may or may not be wholly true in any given case, but it effectually prevents any correct estimate of a future power cost, as the demand can only be measured by making it, and even then it is liable to be raised at any time by a few moments' call for a little more power and once raised can never fall. It does not assume any holidays, strikes or the like and is usually the cause of a large part of misunderstanding of a meter bill.

Sometimes the demand is determined monthly and sometimes yearly, but in any case it would pay to install some form of recording meter showing the amount and time of the maximum loads, because from this data it would be possible to rearrange some part of the work with a very material reduction of the demand charge. This charge is quite a variable one, ranging from 25 per cent. to 50 per cent. of the total bill. It would be evident that a large demand which always came at a time when the power company had plenty of spare power should not be charged as heavily as the same demand coming during the peak of the day's load. This form of metering is not common and ought to be demanded by those customers whose demand is at "off peak" time.

The load factor rarely appears in any meter bill, as it can be taken care of in demand charges so as not to appear and become a cause of controversy. Whenever there is any attempt made to compare an electrically driven mill with a steam driven one there will almost inevitably be a discussion of the "horse power year" and "kilowatt year," which will be as convincing as the usual description of the size of a piece of chalk.

Closely connected with the common "service charge" is a charge for special or expensive construction necessary for the customer which might become useless if power were not bought for a number of years. Oftentimes this charge is embodied in the price made conditional to the signing of a long time contract, or a time contract with a definite specified payment if the contract is terminated previous to its expiration. Such contracts may become complicated by provisions allowing the adding of a future customer who would use a part of the special construction. For example, a long transmission line might be built to serve a large power user and after several years another user might be found or another plant built and if the line could in whole or in part be used, it would follow that the fixed charges ought to be reduced to the first consumer. The idea is, however, right and equitable.

Interruptions due to loss by fire of either mill or power plant are liable to happen, but are generally taken as a business chance which can be covered by liability insurance, or by an agreed upon sum of money as "liquidated damages" for the termination of the power contract and to be protected by an exchange of insurance policies. The power company has the advantage here, as it could get another customer quicker than the mill could get any other power supply, as there would be no competitor.

When power is transmitted by alternating currents it is nearly always found that with the usual types of motors, lines and appliances that there are times when the current actually flowing through the conducting system is not at all proportional to or commensurate with the transmitted energy. Under the changing conditions of the usual commercial service this idle or false current varies

from a negligible to an extremely serious amount.

The name given to the cause of this condition is "power factor." An engineer friend of the author defines it as "something that bedevils the dynamo," others often use the worst language, but a careful engineer says the power factor is the percentage ratio between the true energy and the apparent energy and that the true energy is always less than it would seem to be if judged by the current actually flowing. The more nearly 100 per cent. the power factor is, the better; it averages between 80 per cent. and 95 per cent. under good conditions and under bad conditions may fall to 50 per cent.; when at 71 per cent. the current is twice what it would be at 100 per cent. power factor, and the capacity of lines, transformers and the like is taxed as heavily as it would be with two consumers having 100 per cent., yet the purchased kilowatt hours are but those of one.

As the effect of low power factor is to render all of the electrical machinery of the company of less capacity for developing real energy and of less efficiency, there is a tendency to make a charge for it in the rates. As the average man cannot see why he should pay for something he doesn't get, some companies prefer not to make an open charge for poor power factor but to incorporate it together with the service charge, in the rate quoted.

If this charge can be properly and clearly explained it is a fair charge to make, because it is possible to so buy and operate motors as to make a very material difference in the current demand, and if there is an advantage to be received by the purchaser he will try to get a better layout.

The constancy of the frequency is absolutely necessary if the output is to be kept at its maximum because all types of motors will slow down as the frequency drops. There ought to be some form of rebate for falling off of frequency, as it is impossible in any way to raise the mill output to its normal by any form of speed correction. Commercially, all large companies with systems under careful superintendence do keep the frequency exceedingly close, unless they have a few large customers having variable loads.

The steadiness of the voltage is of the greatest importance because of eye strain from flickering lighting, loss of efficiency, overheating and loss of speed of the motors. The combination of variable voltage and variable frequency is of common occurrence and very discreditable to the operating company. It is far more common than it ought to be and may be guarded against by a properly worded contract.

Every purchaser of power in any moderately large quantity should protect himself by the use of a continuously operating curve drawing instrument, making a written record of some factor in connection with the supply of electricity which will be the most service in checking up his power conditions. These instruments are available for the recording of momentary conditions of any electrical quantity and if properly installed produce a record that cannot well be disputed. For example, a curve drawing demand meter would give a record or power required, the time of starting, short hours, times of shutdowns and the falling off of output towards the end of work hours. The systematic perusal of such records as a part of the regular duties of the superintendent, manager or consulting-engineer, will well repay the time and trouble.

TEXTILE CREDITS

BY E. HOWARD BENNETT
530 Atlantic Ave., Boston, Mass.

If anyone were to ask what has impressed me most in the study I have been making of textile credits for the past few years, I think I should answer that it has been the steady decrease in the amount of "guesswork financing." As I look outside the textile industry, and see everywhere the passion for publicity, for publicity of corporation management, publicity of government conduct, publicity of financial transactions, I cannot wonder that the textile industry should share in the effects of this modern demand. Slowly, and yet steadily, the number of cotton mills whose statements of financial condition are either a sealed book, that only the privileged characters can open, or a mathematical enigma that only the insiders can understand, is diminishing and will probably vanish altogether within a few years.

The loudest demand for a clear and reliable statement comes, naturally, from the banks. To the credit of the textile industry be it said, that bankers usually have had little to complain about, in the financial statements made to them by textile mills seeking to borrow. Occasionally the failure of a mill brings to light a case where even the bankers have been furnished with misinformation as to inventories of raw material on hand or of finished goods as yet unsold, but these instances have been so infrequent as to emphasize, by their rareness, the high average of integrity to which the textile industry may fairly lay claim. Nevertheless, upon our own industry, the bankers are beginning to impose a demand that bodes ill for guesswork financing. They are clamoring for audited paper to a far larger extent than ever before.

Within two recent weeks, three meetings at widely separated points in the United States brought this fact home with distinctness. One meeting at Spokane, Wash., where the clearing house banks had assembled to adopt rules relative to the collection of interest on loans made by them. Their resolution dealing with that subject contained, also, a united demand that borrowers should henceforward furnish them with detailed reports by reputable accountants, based on thorough examination of their businesses. Another meeting was at Cincinnati, where an association of bank men had gathered to consider the problem of check collection.

In the course of their proceedings, however, they adopted a resolution pledging themselves as bankers hereafter to express a preference for audited paper, when they are making purchases from the commercial note brokers. Finally at Boston, where a committee of bankers and business men, selected by the Chamber of Commerce, has been trying to frame a definition of commercial paper, for use under the new Federal Reserve Act, that committee has turned aside from its specific labor long enough to urge the Federal

Reserve Board to require semi-annual statements of condition of bank borrowers, and it specifically mentions certification of such statements as worth while.

These three instances are striking, because each of these important groups of men had not assembled at all for the purpose of considering the accuracy of the statements which borrowers have been making.

The fact is, however, that so general is the cry for precise knowledge about the financial condition of those who borrow, that whenever men have gathered to consider banking problems, either at Spokane in the far West, or at Cincinnati in the middle West, or at Boston in the far East, they have felt impelled to add this demand to those other demands for which they are more especially assembled. Banks are determined to know that the statement furnished them sets forth facts as they are, not merely as the manufacturer believes them to be, or, in the rare case, pretends to believe them to be.

You may be interested to know that at least one state is likely to lend the strong arm of legal requirement to the demand from bankers that guesswork financing shall cease. Massachusetts is the state in question.

For years now, it has compelled every corporation that does business within its borders, or holds a Massachusetts charter, to file at the State House in Boston an annual statement of condition. To some corporations, the requirement has been irksome. A demand for publicity of this sort has appeared like a violation of the secrecy that private business has regarded as its right from the days of Noah. For the most part, the law has been complied with by the corporations. While the gentle art of suppressing the truth has been practiced with real expertness by a good many corporations, few downright and deliberate attempts have been made to deceive the reader of the statements.

A reasonably accurate idea of the mill's financial condition has been given. To my mind, it is very much to the credit of the cotton and woolen manufacturers of Massachusetts that few have imitated the plan which one mill is said to have, of always inventorying its cotton at one cent a pound, and its cloth at a cent a yard, whenever it is making up its statement for the state of Massachusetts.

The minority stockholder, or other part owner of that mill, who does not have access to the books, may be misled by this scheme into setting too low a value upon his shares, and selling them for less than they are worth. That effect, however, lamentable though it is, is scarcely so much to be deplored as is the example which the management of that mill has set to the community, of a lawless spirit that defies the purpose of statutes while observing them to the letter. One reason, maybe, why there has been a general compliance with the general spirit of the law is that a majority of the directors must take oath to the accuracy of the filed statements, to the best of their knowledge and belief, and an auditor, formally selected by a committee of directors, adds his certificate.

The Commissioner of Corporations of Massachusetts now desires to give these statements an even higher standing for accuracy, incidentally striking a telling blow at such practices as that of the mill mentioned above.

Heretofore, the auditor who has been chosen to add his certificate to the filed statement could be anyone whom the directors cared to pick. How frequently he was simply a tool in the hands of the directors is a guess scarcely worth the making. There was nothing in the statute to require that he know anything whatever about accounts. He could be the watchman at the mill gate, if the directors cared to pick one of that type. The purpose now is to have the law so amended that the committee of directors, after making their selection, shall state in writing under oath that this person whom they have employed is experienced as an accountant and qualified to act as an auditor, in their judgment and belief.

Even more effective than this provision is likely to be a requirement that the Commissioner would impose upon the auditor himself. For years the auditor's certificates under oath has been merely to the effect that the statement of the financial condition of the mill that the directors have prepared has been found by him to be "according to the books" of the corporation.

What an avenue of escape from any moral responsibility on his part, or, at least, from the more exacting ideals of accountancy, this has provided him. His own common sense might tell him that the books did not set forth the actual state of affairs. He might discover that the insiders were deliberately making the corporation look more or less prosperous on its books than the facts would warrant. A sensitive man would have some qualms of conscience over the fact that he was to certify to the accuracy of the statement these directors had prepared, if the law itself had not given him so good an excuse for dulling the cries of his conscience that the statement was misleading.

Indeed, this form of oath that auditors have been taking for years is nothing more nor less than an invitation to accountants to forget that their profession has a code of ethics, or that financial statements should tell neither more nor less than the whole truth.

So the Commissioner would require the auditor hereafter to take oath that the statement represents the true condition of the corporation "to the best of his professional knowledge and belief." That single word "professional" put him on honor. No avenue of escape from responsibility or from the demands of his conscience is left. He must find the books either in accord with his own common sense and general knowledge of the fitness of things, or he must withhold his oath.

The suggested law does not say that he shall become appraiser, expert manufacturer or warehouse man, it does expect of him that when he finds a mill undervaluing its stock or overvaluing it, he will refuse to certify to the statement unless these glaring misstatements are rectified.

I have described this proposed change of law in Massachusetts as a blow at guesswork financing. May I add a personal experience to show that the business community is ready for such a change

of law? I was down in Connecticut the other day, and I fell into a discussion with a banker of Hartford, relative to the securities of a prosperous Massachusetts corporation. He was inclined highly to favor them, and so was I. He found only one feature about the corporation's financial statements to disturb him.

The auditor in each instance merely certified that the statement was according to the books of the corporation. He knew the auditor by reputation to be one of the best in this country. He had seen many financial statements certified to by this auditor that did not contain any such hedge in the certificate, as these words "according to the books" constituted. Hence, he wished very much to know whether this auditor was denied information about the affairs of this particular Massachusetts corporation which he ought to possess, or whether he was finding things in the accounts that struck him as not candid.

It occurred to me at the time that the auditor was simply following the Massachusetts statute, and was not seeking to evade any responsibility, but at the request of the Hartford banker, I undertook to ascertain the exact facts.

I wrote the treasurer of the corporation about my Hartford interview, and asked for the facts. You will gather some sense of the extent to which the heads of large corporations are becoming impressed with the value of the utmost frankness in their statements, and of the absolute elimination of guesswork, when I tell you what happened.

He came all of the way to Boston from his mill town bearing information for me, and proof that it was so. He showed me his auditor's report, and there was no hedge about it. He hired that auditor at a substantial cost to probe his accounts, not once a year, but every month; to audit every payment and every receipt; to go over the accounts at every one of his plants monthly, as well as the accounts at his head office; and so thorough is the audit, that the corporation is run on that audit as a basis.

It constitutes the treasurer's means of knowing what is going on at his plants. Of course, when the Hartford banker heard from me the true facts, he was completely freed from any uncertainty. That he should have made the inquiry, however, in the first place, indicates that growing demand for exact information in mill statements, and the solicitude of the treasurer who came to see me is evidence that that demand is being freely recognized, even in advance of the time when the statute will demand it.

IMPROVED METHODS IN THE HANDLING AND DYEING OF RAW COTTON, YARN AND PIECE GOODS

BY LOUIS JOSEPH MATOS, Ph. D.
Of the Technical Staff of the Cassella Color Company, 182 Front St., New York, N. Y.

Formerly, and in the olden times, cotton was most commonly dyed in the piece, and in very olden times in short lengths only, except in case of narrow widths, when the lengths were correspondingly increased.

The actual process was to immerse the entire piece of goods to be dyed quite within the boiling

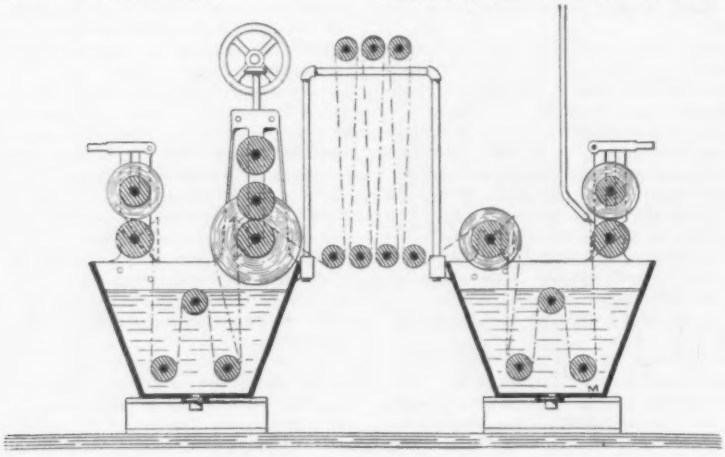


FIG. 1. DYE JIGS WITH OXYDIZING FRAME

dye liquor, and work it around until it had taken up the amount of color to give it the depth of shade desired by the dyer.

In olden times shade matching was not the art that it is today.

Next we have the desire to produce effects of various kinds that led to the coloring of yarns before weaving, and this gave rise to the art of skein dyeing, and as the skill of the dyer increased with time, so in a corresponding way the ambitions of the textile designer increased, with the result that more pretentious patterns were developed.

As the art of spinning advanced, so in a measure the ability of producing colored threads from previously dyed raw cotton increased, and this gave rise to the widely extended practice of raw stock dyeing.

Warp dyeing is comparatively a recent development of the cotton dyeing industry. In former times warps were made from dyed skeins exclu-

sively, but in course of time means were devised for handling warps in dye kettles so that almost any length could be taken care of properly.

Piece goods dyeing has not made the same relative advancement that other branches of cotton dyeing have, but the time will come when cotton piece goods dyeing will be revolutionized, and that levelness of shade, coupled with penetration will be a matter of routine.

Raw stock dyeing is now a matter of dyeing in two ways, either by moving the loose cotton through a stationary volume of the dye liquor, as is done in the common open dye tub by poling, or as is common in some of the well known types of revolving dye machines; or by keeping the mass

LOUIS J. MATOS

of cotton fiber in a fixed and immovable position, and causing the dye liquor to circulate regularly through the cotton by means of a force pump, as is common to those machines that are designated "pack system" machines.

Each of these two methods of dyeing possess their disadvantages. The former, in that it tends to an impairment of the condition of the cotton fiber to such an extent as to lower its spinning value, and in some instances to a wastefulness of the heat, especially in dyeing in the old types of stationary open kettles.

This method of dyeing, whatever the results might be as to shade or condition of the cotton, is also positively wasteful of the dye. Of course, it must be remembered that the open tub method of dyeing is a relic of the days when shades were fewer than they are today, and when logwood—always a cheap dyeware—was the principal coloring matter used in the cotton dye house.

While poleing in the open kettles, and tumbling in rotary machines generally produced fairly even shades, this apparent advantage is offset by the amount of man-killing labor over the open tub.

The so-called pack system machines have revolutionized raw cotton dyeing, and at present it seems that this general method will hold its own for a long time to come, although it is possible that various improvements will constantly be made towards simplifying the machines and their appendages.

The principle of dyeing fixed masses of cotton or other loose fiber by circulating dye liquor is very old, but it is only during the last fifteen or twenty years that any attention has been given to the development of the idea, and this actually from manufacturers and dyers rather than from machine builders. This unusual condition of affairs being traced indirectly to commercial conditions of competition—the desire to eliminate whenever possible hand labor by the substitution of machines.

One of the disadvantages of the pack system is traceable directly to the human element, and is the almost impossibility of packing the cotton so evenly and uniformly that unevenness is eliminated. At times, leads will form through which the dye liquor circulates with greater freedom and there causing much heavier shades than where the dye liquor encounters greater resistance. This condition appears to be attracting the attention of inventors who may in time overcome this trouble.

The pack system of dyeing, by whatever name known, however, has come to stay, and must be accepted by all progressive dyers as the last word when maximum output at the lowest possible cost is desired, not only lowest cost for handling, but for the greatest saving in dyeing, due directly to the relatively small volume of dye liquor necessary for a given weight of cotton to be dyed—the spent dye liquor being, in the great majority of instances, of no use to serve as a "Standing Kettle" about which dyers are so much concerned when dyeing in open kettles.

The following figures from practice show the varying amounts of dye liquor required for circulation in average pack-system machines:

	Cotton.	Liquor.
1.	150 lbs. (Direct)	160 gals.
2.	140 lbs. (Direct)	150 gals.
3.	250 lbs. (Direct)	200 gals.
4.	200 lbs. (Developed)	120 gals.
5.	200 lbs. (Developed)	100 gals.
6.	200 lbs. (Direct)	200 gals.
7.	140 lbs. (Aftertreated)	120 gals.
8.	150 lbs. (Direct)	160 gals.
9.	100 lbs. (Direct)	150 gals.
10.	150 lbs. (Direct)	180 gals.
11.	150 lbs. (Direct)	180 gals.
12.	100 lbs. (Direct)	100 gals.
13.	90 lbs. (Direct)	100 gals.
14.	350 lbs. (Direct)	300 gals.

When it is considered that one pound of cotton in almost any form when dyed in some such machine requires only 1 gallon of dye liquor, as against 3 gallons of water usually required for dyeing in the open kettle; the saving is to be noticed in two directions, less steam to bring the tempera-

ture up to the boil for a given quantity of cotton, and a saving in water for washing, as the washing is always done before the removal of the dyed cotton.

The most serious problem of washing textiles is usually to be settled as soon as superintendents and dyers give some attention to it, and not leaving the "washing" to those who only proceed along the lines of "guesswork." It is perhaps not thoroughly known, for a given weight of cotton containing a definite amount of impurities to be removed, that if we wash twice with a given quantity of water, we will reduce the amount of impurities more than if we wash only once with double the volume of water. Suppose we have 500 pounds of cotton, being dyed in 500 gallons of water, after the dyeing and running off of the spent dye liquor, there would be held mechanically by the cotton 60 to 70 gallons of liquor, and which would contain one-seventh of the original amount of chemicals—except the amount of the dyestuff—used in dyeing, and if this residual one-seventh impurity is further reduced by a further washing with 500 gallons of water, we have as a final residue one-seventh of one-seventh or one-forty-ninth of the original substance that should be removed. This residual one-forty-ninth is so small a quantity that for ordinary manufacturing purposes may be neglected.

The entire washing proposition is more important to a mill and should be given more serious thought and consideration than it usually receives.

Cotton skein yarn dyeing has not progressed much beyond the ordinary open kettle method of dyeing, the skeins being manipulated by hand, but it is safe to assert that rotary skein dyeing machines will ultimately prevail, the packing system not likely to prove universally applicable for such work on account of mechanical reasons that appear to be extremely difficult to overcome, notably the tendency to form leads resulting in uneven shades.

Warps, however, always a most interesting branch of cotton dyeing, is in the revolutionary or transition period, and with the great attention that has been given to it during the past few years, both in this country and abroad, leads me to believe that the perfect dyeing machine for cotton in this form is not far distant. The idea of dyeing a heavily wound mass of cotton thread on a hollow and perforated spool is old, but it has taken both time and courage to persist in developing the idea so that it might become technically practical. Today there are several such machines on the market, especially constructed for this class of work, and the results obtained indicate that they are no longer experiments.

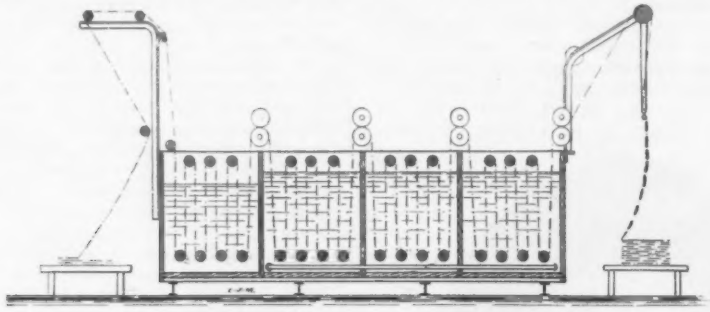


FIG. 2. A CONTINUOUS DYEING MACHINE

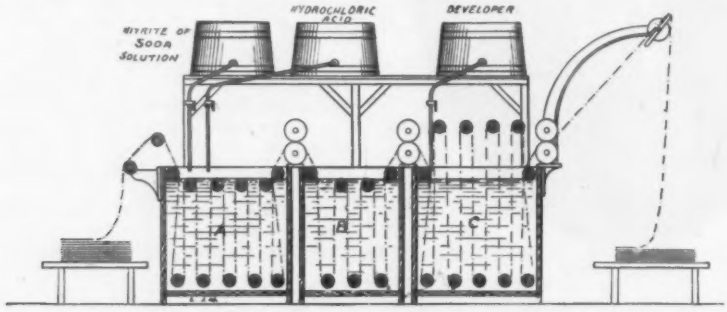


FIG 3. APPARATUS FOR DIAZOTIZING AND DEVELOPING

By dyeing cotton warps in such machines a very great saving is effected, not only in direct labor and handling of the warps in this condition, and which contributes to a very much better fabric. As the warps are correctly wound on the dyeing spool at a uniform tension, and put through the slasher and wound on to the loom beam at the same tension, it cannot be otherwise but that the warps are practically perfect.

On the other hand, however, the cost of such modern warp dyeing machines is so great that many mills defer buying them, preferring to con-

tinue using the old Scotch tubs or long chain systems, and hoping that the unforeseen may not occur to impair the quality of the dyeing or condition of the warps.

The dyeing of cones and cops, a very favorite method of dyeing cotton in many European mills, is not likely to become at all popular in American mills on account of the higher labor cost in handling the cotton in this condition, and besides we entertain the idea that by handling the skein dyed cotton, as is customary in American mills at present, we are able to obtain a more uniform run of cops than each lot of cops from a specially constructed dyeing machine is liable to turn out. It is generally accidental when two succeeding lots of cops from the same cop dyeing machine, dyed with the same dyestuffs, are of exactly the same depth of shade. When standing kettle dyeing is undertaken, the final conditions are even worse. For cotton mills of small output, such dyeing machines are without doubt very good, but time considered, the output of dyeing is restricted, and out of proportion to the cost of the installations.

Cotton piece goods dyeing resolves itself to three broad methods: Jig dyeing, continuous machine dyeing, padding machine dyeing, and, of course, each of these methods is directly applicable for solid colors only.

Jig dyeing is deservedly popular on account of the ease of control and regularity of quality of output, besides being easily adaptable to nearly all classes of cotton goods and groups of dyestuffs. Dyeing with certain classes of colors, jigs must be constructed to cope with the new conditions imposed by the chemical principles involved in the use of the newer dyes, and any attempt to make improvised makeshifts will only lead to disappointments. In this connection, it might be well for us to bear in mind that the large color works have elaborate experimental dye houses fully equipped with commercial size apparatus in order to try out their new discoveries, and to devise proper methods for their use, in connection with the combined skill of both engineers and chemists. These color works also have their own machine shops, to be called upon for special machines or apparatus to meet pending requirements demanded by the properties of new dyes.

When new ideas are thus developed, it does not imply that other workers, or local conditions existing elsewhere may not modify the method originally devised in the color works, but it is quite fair to presume that their recommendation may prove of value as a means of preliminary trials of a new dye in a given mill.

Jig dyeing is modified by the introduction of

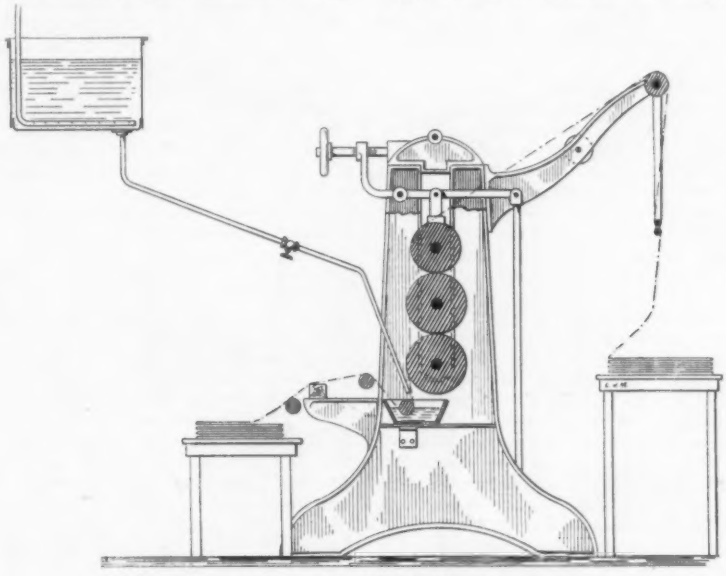


FIG. 4. A PADDING MACHINE

"skys" or continuous oxidizing frames, as shown in Fig. 1, to permit the dyed fabric to obtain the full benefit of the oxidizing action of the air. Jigs are also provided with carefully balanced heavy squeeze rollers, to introduce which, in many instances, required considerable diplomacy on the part of the dyestuff demonstrator to overcome objections on the part of the dyer. The gradual introduction of squeeze rollers on all jigs is now only a matter of a short time. Submerged rollers and spreaders to keep the cloth completely beneath the surface of the dye liquor, is a matter of common note in cotton piece dye houses using regularly immedial and many vat colors.

The continuous machine is not as common in this country as it should be. It is one apparatus that permits of a large output. Ordinarily constructed to admit of from two to three or five compartments, as shown in Fig. 2, each of which is provided with a pair of squeezing rollers, the upper one of each pair being generally coated with rubber. Immediately preceding each nip is generally mounted a spreader to keep the cloth smooth and free from wrinkles.

Owing to the tendency of the strength of the dye liquor to vary, due to condensation, it is thought best to provide for heating the liquor by means of indirect steam, together with a steady inflow of stock dye liquor from overhead tanks, thus permitting, after the machine is started, a uniform shade to be produced upon a large quantity of cloth.

The amount of the stock dye liquor allowed to flow into the first compartment corresponds to the amount of liquor taken up by the cloth and mechanically retained after passing the last nip. When once the speed of the machine, and rate of inflow is fixed, the process is almost continuously automatic. As a rule, the first compartment is for wetting out or preparing the cloth for dyeing, and for the general run of staple shades such as black, brown, dark blue, etc., dyed with diamine or direct colors, this first compartment is charged with soda ash only.

The continuous dyeing machine is also used for the well known diazotizing and developing process. The construction is somewhat modified, however, to meet the different conditions and usually has only three compartments, as shown in Fig. 3. After the pieces have been previously dyed and washed on another machine, they are transported to the diazotizing and developing apparatus, the first compartment of which is the diazotizing box (A) containing the nitrite of soda and hydrochloric acid, both of which solutions are fed from stock tanks mounted overhead.

The second compartment (B) is a rinsing box containing acidulated water, and the third (C) is the developing box, containing the developer found best suited for the shade to be dyed and which is replenished from an overhead tank. Each compartment is separated from the other by a heavy nip. Where continuous diazotizing is practiced, the location of the machine can be conveniently placed in a boxed-off corner of the dye house and provided with a suitably constructed ventilator leading from a hood suspended over the diazotizing tank so that the fumes may be led to the open air.

Paranitraniline Red. Closely related to the diazotizing and developing process above described is the so-called paranitraniline red process, which, while not requiring any particular type of dyeing machine, yet it has been found best to make use of a machine specially constructed for this purpose. The goods are first prepared or "mordanted" by passing through a beta naphtol prepare, after which they should be made absolutely dry, then passed through the padding machine, constructed as shown in the accompanying sketch, where the first compartment consists of a trough containing two small submerged rollers which keep the cloth below the surface of the diazotized paranitraniline solution. After leaving the second roller, the cloth is passed between a moderately heavy nip, subsequently given an air passage, finally given a thorough washing with two jets of water, then a nip and then through two washing compartments and final nip and terminated with a plaiting down; the usual boiling soap and rinsing follows.

Dyeing in the padding machine is becoming better understood in this country, and while a number of piece goods mills employ it yet there is room for its further extension. It permits of the production of a very great output and where the fabric to be dyed is not heavy, very excellent results both in penetration and levelness are obtained. Two forms of padding machines are common, one for the direct padding in one short passage, the other for a slightly slower but with a greater amount of fabric in the dye liquor. The first machine, shown in Fig. 4, consists of three superposed rollers taking the dry cloth from the small submerged roller into the color box, given two nips and plaited down. This machine serves for almost every variety of light and medium shades. By means of an overhead stock tank, for the dye liquor and in which is a closed steam coil, the stock liquor can be made up in sufficient quantity for a morning or a day's run. This method permits of a very large output of uniform shades. In usual mill practice, knowing beforehand the amount of cloth to be dyed, the padder prepares only sufficient dye liquor for a day's run or to dye the amount of cloth a given shade. On standard goods, running for weeks at a time, no difficulty is encountered in making successive fresh batches of color each day.

The second form of apparatus previously alluded to, and shown in Fig. 5, provides for a box containing a double row of submerged rollers similar to a single compartment of a continuous dyeing machine, through which the cloth passes, thereby being given about eight up-and-down passages through a large volume of dye liquor (instead of one passage in a single submerged roller, as in the former case). This modification of the machine permits of very good penetration and a more thorough fixation of the dye by dyeing, than squeezing with the single roll padder. This method has been called the "Jigger Dyeing Method," although there seems to be no connection between the standard jigger and such a machine. The goods are prepared for dyeing, and passed through the machine, plaited down or rinsed before plaiting. In case of either of the above two machines, one passage only is employed, which means that the shade and dye formula can be carefully worked out beforehand.

The above methods of dyeing apply equally to the direct or diamine colors as well as to the sulphur or immedial colors. In dyeing the latter, it becomes necessary to make use of the oxidizing action of the atmosphere and dyers have found it advantageous to construct over the machine, oxidizing frames consisting of a series of rollers in order that an air passage can be conveniently given. So-called vat dyeing is done in a small way by making use of dye kettles similar in almost all particulars to the old fashioned cloth dyeing machines and capable of handling at one time eight or ten pieces of an aggregate weight of 400 pounds more or less. The wooden partition serves to separate the pieces from contact with the steam pipe and which always facilitates the addition of fresh portions of dye liquor. The pieces are usually dyed in rope form and consequently this precluded the possibility of medium shades in handling. As a matter of fact, black and dark shades on cheap cloth only are dyed in this way.

Vat Colors. Since the introduction and won-

derful development of the so-called vat colors, marked improvements have been noticed throughout the entire field of handling and manipulation of cotton goods. These changes have been brought about by the peculiar characteristics of the various classes of colors that belong to the vat dyeing group and which differ so much from other classes of dyes heretofore used, that they stand in a class by themselves.

The dye solutions of such colors are known to chemists as "reduced" solutions, that is, the dyestuff itself has been subjected to the action of chemical reducing agents such as hydrosulphite of soda, and which, when in solution alters chemically the condition of the dye bath, imparting at the same time to the dye liquor, a color entirely different from that of the ultimate color of the fabric when dyed. Upon immersing cotton in such a reduced chemical solution for a short time, then squeezing, washing, and afterwards exposing to the air, the proper color is restored by the action of the oxygen of the air, which thus counteracts the "reducing" action of the hydrosulphite in the dye liquor.

The principal property possessed by the so-called vat dyes is that they are much faster to the usual influence of wear, exposure and repeated laundering than other heretofore well-known dyestuffs.

The writer's experience in the use of the vat colors has been limited to the handling of cotton dyed with the so-called group of hydron dyes, and which will be refered to for the purpose of illustrating this particular type of colors, but in doing so he does not desire to create the impression that other vat dyes do not possess properties of equally general interest.

Hydron blue is the type of a group of dyes that possess the peculiar property of prolonged resistance to the action of hypochlorite of soda, and consequently appear to be of particular interest in the manufacture of cotton goods. The shades of blue produced by this dyestuff when dyed heavy and full upon cotton, unlike time-honored indigo, remain upon the cotton where the dyer puts them, and do not bleed off or stain adjacent whites as is one of the characteristics of indigo.

The group of dyes represented by the hydron may be dyed in all existing forms of machines, but it has been found an advantage to recommend slight modifications where such alterations do not interfere with the usual working of the dye house. Under ordinary conditions, rotating raw stock dyeing machines or dyeing machines constructed in accordance with the pack system ideas, necessitates no other requirements. On the other hand, skein dyeing appears to offer a chronic disadvantage of requiring the use of bent iron sticks, in order to keep the skeins well beneath the surface of the dye bath. On the other hand, warps can be dyed on the long chain system or in any suitable warp dyeing machine, on account of the relatively small surface of the dye bath exposed to the atmosphere, or an indigo warp dyeing machine may be modified for the same purpose.

Beam dyeing machines, however, have served a very useful purpose in making it possible for hydron and other vat colors to be dyed satisfactorily, and there is no doubt but that this system will be greatly extended.

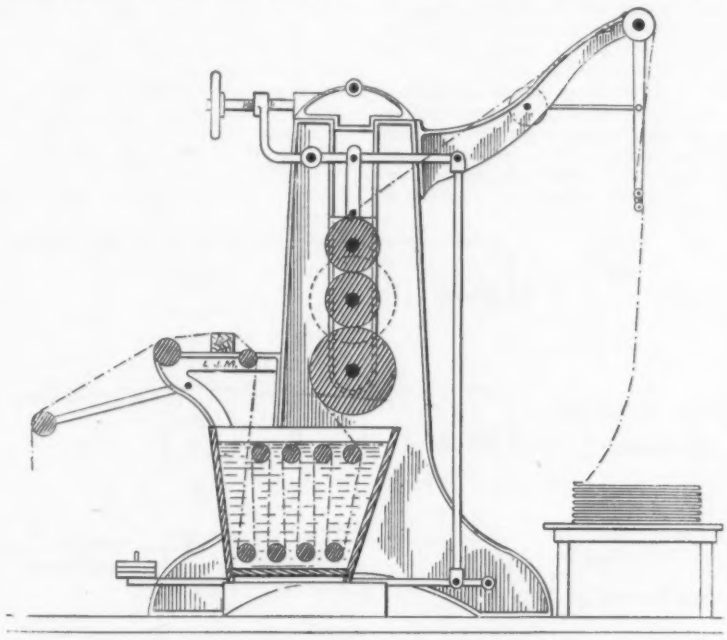


FIG. 5. A JIGGER PADDING MACHINE

The particular point to be noted in the dyeing of warps on beams, with vat colors, is that but a relatively small volume of dye liquor is necessary and which is continually circulated in alternating directions through the beam, and with little or no exposure to the outside air. While the dye solution remains in a reduced condition, no oxidation takes place, owing to absence of contact with the air, and perfect dyeing consequently progresses. After the circulation of the dye liquor and sufficient time has elapsed and the excess of liquor drawn off, then oxidation may take place advantageously, as indeed it must, in order to fix the color and develop the ultimate shade.

It seems to the writer that as dyeing machine builders study the dyeing details of the processes necessary to apply the modern dyestuffs to cotton, the apparent difficulties now encountered in dyeing will be rapidly overcome.

Having briefly outlined the principle methods of dyeing cotton, it only remains to direct attention to the fact that even the simplest process is essentially a chemical operation, and to secure the results having the highest commercial value, it becomes necesary that every advantage be taken to place at the command of the dyer those facilities that modern science points out as essential to good work.

In the matter of dyes, it is rapidly becoming a subject of prime consideration on the part of the manufacturer to employ those that have been found best suited to meet the requirements and conditions imposed by later day commercial demands.

In former days, and not so many years ago, almost any colored fabric, if prettily woven or printed, would find a ready sale, but at the present day—owing to broadly conducted campaigns of education—the ultimate buyer is the creator of the demands which must be met by the mill man, and in the last analysis, it devolves upon the dyer to keep abreast of modern color achievements and dye his goods to fully meet the conditions imposed.

METHODS OF REDUCING THE FIRE HAZARDS OF COTTON CONVEYORS

BY H. A. BURNHAM

Engineer and Inspector Factory Mutual Fire Insurance Companies, 31 Milk St., Boston, Mass.

The writer had the pleasure of presenting at the last New York meeting of the American Society of Mechanical Engineers a paper describing the safeguards usually applied for the prevention and control of fires starting in connection with cotton conveying systems.

Such fires form from 50 to 75 per cent. of all cotton mill fires reported and the key to the problem of preventing them is the removal of foreign substances from the stock, it being well known that this large percentage of fires is caused by such substances as bits of metal, stone, or matches which find their way into the cotton and that the vigorous treatment the cotton receives in the pickers is sure to seek out such material with troublesome and perhaps dangerous results in the form of fires.

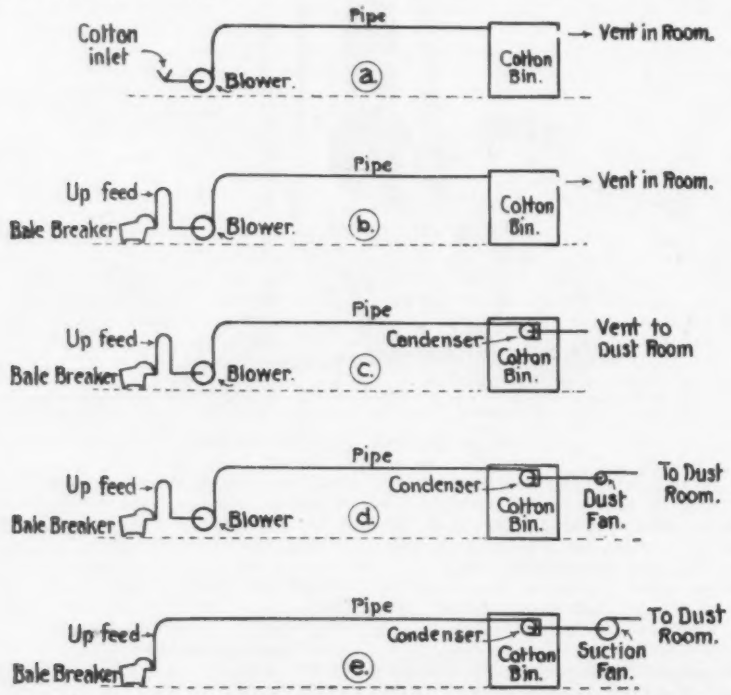


DIAGRAM SHOWING DEVELOPMENT OF SUCTION SYSTEM OF PNEUMATIC COTTON CONVEYOR

None of this foreign material is more difficult to remove than matches, as they are too light in weight to separate readily from the cotton by ordinary means. In this matter more than in any other, preventing the matches from entering the stock is the only true solution of the problem. This has been actually accomplished in effect in many mill properties by providing the help with safety matches to the exclusion of all other kinds.

The particular point in these preparing processes to which attention is directed is the mechanical arrangement of the conveying apparatus used for transferring cotton from the bale opening room to the picker room. By proper arrangement of its parts, this apparatus has proved to be an excellent means of removing nearly all of the heavier foreign material from the cotton. There are records of many instances in which, by the observance of the simple precautions described, troubles from fires occurring with great frequency and regularity have almost entirely disappeared.

PNEUMATIC CONVEYORS

It is hardly necessary to describe to you the machinery commonly found in opening and picker rooms, further than to say that we are, in this case, concerned chiefly with the bale breaker in the opening room, the automatic feeder in the picker room and the conveyor operating between them, which may be of the pneumatic or of the mechanical type.

The pneumatic cotton conveyor, as it exists today, is the outcome of attempts made in earlier days to save the labor of trucking baled cotton from the storehouse to the picker room. Mills having storehouses separate from their manufacturing rooms, and especially the larger mills, found this labor a considerable item.

At that time it had been common practice to convey damp cotton from dye house to drier by blowing it through a long sheet metal pipe attached to the discharge outlet of a pressure blower, the stock being fed in through the suction inlet of the blower. In applying this method to dry cotton fed by hand, however, fires in the blow pipe were common, and the air blast made them so intense that the arrangement in this crude form was considered far too risky for general use. (See a, Fig. 9).

In many kinds of work the action of the air on the cotton in transit was found to be beneficial to subsequent working of the cotton; so much so, indeed, that manufacturers who had not at first thought it worth while wished to use the blowing system.

The causes of these fires were found to be foreign substances in the stock, or the wedging of the cotton in the fan casing, due to the feeding in of masses which were too large to pass through. In some cases this fault was aggravated by the too small clearance in the fan between the blades and casing. The number of fires with this arrangement was considerably reduced in some cases by using blowers having bronze blades. The introduction of the bale breaker or opening machine above mentioned to take the place of the irregular hand feed also contributed materially toward the elimination of fires from these causes. (See b, Fig. 9.)

The general use of the cotton condenser in its present form, however, furnished means for avoiding the objectionable blast of air and cotton in the bin or room, and of operating the entire system under suction instead of under pressure. This advantage of operating under suction entirely, however, was not at once recognized, and many systems were installed with the stock blowing through the fan, discharging to the condenser (See c, Fig. 9), or with an auxiliary smaller fan beyond the condenser and known as a dust fan. (See d, Fig. 9.)

The final step to the present practice was to eliminate the blow fan, and to make the dust fan large enough to produce the necessary air current, so making the cotton-carrying part of the system operate entirely under suction. (See e, Fig. 9.) This arrangement is known as a "suction" system.

The condenser consists of a slowly revolving cylindrical screen in a metal casing, with air pipe connections so arranged that the air current in passing through deposits on cotton on the outer surface of the screen, from which it is removed by a small roll, the cotton dropping lightly from this roll.

SUCTION SYSTEMS

Under the most favorable conditions, pneumatic systems arranged under suction have been successfully operated through pipes up to 900 or 1,000 feet in length, handling quantities up to 4,000 pounds of cotton per hour. The limiting distances and weights of cotton are determined by local conditions, such as size and tightness of pipes, number of bends, uniformity of feed, and adjustment of air passages through the condenser.

In planning a new system for cotton conveying and distributing, or in remodeling an old system, the following essential features of this arrangement should be obtained, as far as possible:

Removal of Foreign Substances. Provision should be made for heavy substances to drop out of the stock before entering the conveyor pipe. This can be done by having the cotton pass vertically upward into the conveyor pipe, shaping the inlet like an inverted funnel or box over the feed table or apron, and making the vertical part of the pipe about 12 feet high. To obtain the desired vertical height it is sometimes necessary to use a long radius inverted U.

Location of Fan. The fan should be so located that no cotton will pass through it. In cases of extreme length this condition can be met by installing two separate systems in series with a relay station at which the condenser of the first system discharges to the inlet of the second.

Disposal of Air Vents. Air currents from the system should not discharge into the main rooms. This condition is usually met by discharging the air direct to the dust room.

Location of Pipes. Long pipes should be generally located outside of main rooms and should not pass through important fire walls or floors. Trouble from condensation inside the conveyor pipe in cold weather, which sometimes arises, may be avoided by providing an auxiliary cold air inlet, and in difficult cases by covering the conveyor pipe, where out of doors, with non-conducting covering.

Pipes should have joints riveted in addition to being soldered and have suitable handholes for cleaning. This is to guard against breakage of the pipe in case of fire from inside or outside the pipe.

Variations from this arrangement are frequently necessary, depending on the number of varieties of stock, the quantity, quality, and distance to be carried, as follows:

Omission of Bale Breaker. In the opening room of the smaller mills, the bale breaker or automatic feeder is often omitted and the cotton fed from a pile previously shaken out by hand from the bale. In this case the stock should be fed across a slatted movable table under the inverted cone of the inlet pipe. Uniform hand feed, however, is difficult and without the automatic feeder, frequent clogging of the condenser may result.

Omission of Mechanical Conveyor in Opening Room. In some of the older systems or where more than one pneumatic conveyor is to be fed, the mechanical conveyor in the opening room is sometimes omitted by forming a pipe connection between the automatic feeders and the branches to the conveyor pipe. In such cases this connection may be in the form of a flattened conical pipe sloping downward and having an opening at the lowest point opposite the upward turn where heavy material may drop out.

Omission of Mechanical Conveyor in Picker Room. At the picker room end, in case several staples are used, the mechanical conveyor is often omitted and the cotton delivered direct to bins through condensers. Under these conditions, the condensers may be piped in parallel with proper switches and the same fan used for all.

PRESSURE SYSTEMS

In handling cotton mixed with some wool, as in knitting mills and felt mills, or in colored cotton mills using a large variety of colored stock, pneumatic systems are usually operated under pressure instead of suction. The reasons for this are: (a) stock containing above a very small percentage of wool cannot be successfully handled with condensers, the greasy nature of the wool causing the stock to stick and clog the mechanism, and (b) in handling colored cotton the bins are often so small and numerous that the use of a condenser for each is impracticable. Mechanical conveyors, also, are objected to by manufacturers for handling colored stock, on account of the liability of small tufts of stock caught in the mechanism afterward finding their way into lots of another color.

The pressure system, improperly installed, is dangerous to life and property, as the strong blast of air intensifies any fire in pipe or near its outlet. The safest arrangement of such a system, where it must be used, is obtained by placing the cotton inlet and the cotton outlet both on the discharge side of the blower, causing the stock to enter by means of a hopper having at its bottom a vane or nozzle projecting into the conveyor pipe at such an angle as to cause an injector-like cone at the point of inlet. This device is practicable, however, only for distances up to about 75 feet. Another method adapted for longer distances is to use a pair of flexible surfaced rolls forming the upper part of an air-tight feed box.

At the delivery end, with either of the above arrangements, the pipe should terminate in a bin with tight walls with non-combustible surfaces, and with vent through a screen piped to such a point that no blast of free air can enter any important room.

MECHANICAL CONVEYORS

Mechanical conveyors are often used between the opening room and picker room bins, or airing rooms. In such cases these rooms are usually near each other. The practice of passing these conveyors through openings in the partitions between adjoining bins has proved objectionable, as fire may enter several bins at the same time.

To avoid this objection, the conveyor can be placed over the tops of the bins, discharging through protected traps in the top. This arrangement requires considerable head room. Another arrangement is to place the conveyor high up at the front or rear wall of the bin and discharge it through small protected openings in the wall. This can best be done where the bins are not deep from front to back and where the conveyor discharges from its side.

In either case the openings through which bins are fed from mechanical conveyors should be protected by tight-fitting, tin covered shutters interlocking with the switch of the conveyor so any shutter will be open only when its bin is being filled.

As with the best of machinery and with all the safeguards thus far described, we cannot hope to eliminate all fires from the preparing rooms, it is important that of such fires as may still occur the extent be made as small as possible. This is especially desirable in mills which store temporarily in bins in the room, considerable quantities of opened cotton of various long staples, and is usually best accomplished by making the bins only moderate in size and making the partitions of adjoining bins tight from floor to ceiling.

AUTOMATIC SPRINKLERS

Having limited the number and extent of fires, the matter of promptly controlling those which do occur should be cared for. In addition to the automatic sprinkler equipment, always needed at the ceiling of the cotton working rooms, sprinklers should be placed in the bins, in the condensers, under traveling aprons, inside and under picker trunks and close over the cotton in the hoppers of the automatic feeders.

AIRING EFFECTS IN PNEUMATIC SYSTEMS

Reference has been made to beneficial effects produced on cotton by its passage through the conveyor pipe. The nature of this effect is probably akin to that produced by the so-called aging, or airing process, as practiced extensively in England, and to a less extent in this country. In that process the cotton is allowed to lie for several days in its opened state in large rooms provided for this purpose. In case of a large mill this may require exposing to air of 75 to 150 bales at a time, so whenever a fire occurs from any cause in

one of these airing rooms the loss is likely to be unnecessarily great, due to accidental mixing of staples or wetting, or both.

That this benencial effect does actually exist with a pneumatic conveying system is evidenced by the facts that (a) better working of cotton has been reported in some mills after this conveying system has been in use, even when the class of work done has not warranted the use of airing rooms. (b) Ageing bins have been discarded in certain mills where the pneumatic conveying system is in use. (c) Machines have been devised and brought into quite general use, whose successful performance depends partly on the violent agitation of cotton and air within the machine.

It is not likely that the advantages of the airing room for conditioning of cotton can be supplied by a pneumatic conveying system or by any machine at present known, because the element of time appears to play an important part in the effectiveness of the airing room treatment. It is doubtless possible, however, with the aid of these mechanical devices, supplemented by air conditioning apparatus designed to produce a definite degree of humidity in the air which carries the cotton, to closely approach the conditioning effect now produced by airing rooms, so making it possible in many cases to greatly reduce the airing room space or to dispense with it entirely.

In addition to the specific remedies which I have described and which have proved their worth for reducing fire losses in connection with the use of pneumatic conveyors, this suggestion of the possibility of its additional usefulness is offered for your further consideration.

In concluding, I would state that the practicability and safety of the arrangements described for conveying stock, have been repeatedly proved and they should be adopted in all mills where the old method of passing stock through fans is still in use.

SYSTEMATIC SUPERVISION IN DYEING AND BLEACHING

By ANDREW FISHER, JR., Hyde Park, Mass.

No department in the mill needs intelligent supervision more than the dyehouse, yet few mill men ever keep accurate records of the costs of dyeing the various shades produced. Usually, dyers have an approximate idea of the costs of different shades, but they are not carefully kept and recorded.

Systematic supervision must result in progress, individual initiative being preserved by encouragement from the executive head. We cannot have progress without initiative, therefore let us have intelligent supervision in order that individual initiative may meet with its just reward. If this paper, by mentioning a few incidents of a dyehouse and bleachery routine causes you to think a little, some good will result.

Progress in the dyestuff industry has been rapid, the Germans now having the supremacy in the dyestuff and chemical business. The quality and strength of most dyestuffs have been wonderfully improved during the past twenty years, and as a result, many fast colors are now in use, much to the disgust of paper makers and other users of rags and mill waste.

The use of dyestuffs and chemicals has followed along lines laid down by the manufacturers, and the user and the maker cooperate somewhat, although it may be safely said that the user is more conservative. In a recent conversation with a gentleman of the old school this remark was made, "No, we do not require fast colors in our mill." Doesn't it seem as if the user should demand fast colors, rather than object to them?

Industrial research along these lines should be carried on to a much greater extent by the cotton manufacturers, who should constantly strive to improve the quality of their product. A man recently took charge of the dyeing department of a large concern. The results obtained in the department previous to his arrival had been poor. This man introduced a system of systematic trial and thorough test of every dyestuff submitted. His method of keeping records is somewhat as follows: He uses an ordinary filing cabinet, provided with indexed folders, similar to those used in filing correspondence. On each folder is placed the name of each dyestuff submitted for trial, the date, price quoted, maker's name and address, as well as the formula used and a sample of the dyed result. The tests of value to him are:

1. Fastness to light.
2. Fastness to washing.
3. Fastness to bleaching.

These tests are made on the dyed sample and neatly mounted on the folder. As a result, he always selects suitable colors for his work, taking no chance of putting out goods unable to stand all sensible requirements.

Under the system previously used it was impossible to know definitely the dyestuffs used to produce each shade, the cost, or the trials made to produce the same shade with other colors.

Consequently the salesmen calling at the mill were unable to know if the goods they carried would be of value to the concern, and never felt certain that the samples submitted were given a fair trial. Whenever a new shade was wanted or any dyehouse problem arose, very little reliable data was available. The new man has every shade matched up with all the latest as well as cheapest and fastest colors, and keeps his laboratory staff everlastingly at it, and has little trouble in getting any desired shade at short notice. For example, take a fairly heavy green shade. This is rather expensive, and it will be well worth while to be careful to use the dyestuffs, which may be obtained at the lowest price, without sacrificing anything in the way of quality.

Very often laboratory tests of colors are not carried out on a sufficiently large scale to be of much importance to the dyehouse. It is advisable to always conduct tests on a large enough sample so that the results will be close to those to be obtained under practical conditions, and in all cases costs must be determined from the actual work, not from samples. The cost of drugs used in the dyehouse over a period of six months must exactly balance the sum of the costs which is charged against each shade produced, and an

account of all redyes must be carefully kept. In this way the efficiency of the department will constantly improve.

As a general proposition, the labor and dyestuffs used per pound of goods dyed may be reduced by making the batch as large as possible. A man can handle the work better and the shade will run more uniform. This is especially true in long chain dyeing of warp yarn where all the chains making up the set are dyed in one bath.

For piece goods dyeing, the keeping of accurate records is extremely important, as the shade is usually matched by making one or more additions of fresh color. In some dyehouses, the dyer is paid a bonus for matching his shade in two trials. The fewer additions necessary and the less time required, the greater the chance for uniformity, and a bonus of this kind, if sensibly carried out, is found to be profitable to both the manufacturer and the workman. By constant examination of shipments of dyestuffs received and close inspection of the results obtained in the mill, the laboratory may become a great aid to keeping results uniform and helping the dyers earn their bonuses.

If the exact cost of dyestuffs, chemicals and labor for dyeing each shade is recorded, the executive of the concern may find it possible to avoid expensive dyestuffs and expensive shades. If orders can be obtained on styles using shades of low, rather than high cost, profits are materially increased. If dyestuffs and labor are constantly being reduced, the men in the dyehouse may well be given a share of the increased profits which they have helped to earn.

Systematic research work in connection with bleaching and dyeing must become more general. Years ago when chemicals were very expensive, much greater care was taken to obtain economical results.

The writer once made several experiments to determine the most efficient method for bleaching raw cotton and found that when water and chlorine gas are used without any alkali being present, less chlorine is required. This corroborates Berthollet's contention of one hundred years ago. The operation was carried on in a pressure machine, that is, the cotton was packed into the machine and the cover screwed down tightly, the bleach liquor then forced in from beneath and out through the holes in the cover. It was then circulated for about fifteen minutes to make sure of uniform results. The working pressure for the operation was about fifteen pounds per square inch. The bleaching powder solution was found to be cheapest and the results were about the same as far as uniformity was concerned. Bleaching powder is at present much the most economical method of obtaining chlorine for bleaching cotton.

The results of my trials led us to make certain changes which made the bleach house turn out more uniform results at less cost, and convinced me that the whole dyehouse problem is to be handled best by exercising intelligent and systematic supervision over the workmen. If we keep everlastingly at it we will find the most economical method for producing each desired result and if the executive power happens to be placed in the hands of men capable of comprehending the chemistry and mechanics involved in these operations, the efficiency and economy of the dyehouse should be excellent.

ECONOMY IN HANDLING MATERIAL IN COTTON MILLS

BY WILLIAM F. HUNT, M. E.
Consulting Engineer, 115 Broadway, New York

The watchword of the age is conservatism,—not only by national economy in the use of the virgin resources of the country, but also by economy in the use of labor in the industrial world.

Economy in handling material is most important at this critical time in the manufacture of textile products. The raw materials are bulky and inflammable and the many transfers of stock in process, the receipt, storage, transfer and shipping of the product as well as the handling of supplies such as coal, lumber, etc., are numerous

WILLIAM F. HUNT

and constant. The area that must be served is enormous, the distances long, and the material must be delivered on various floor levels. This is particularly true in plants that have grown from small beginnings and where the organization is different from that which the mill engineers would design today. Particularly important is the economic utilization of mill yard and building areas.

My experience has been the handling of material, and the entire subject matter of this paper is confined to that subject. I place before you some considerations and methods that have been helpful and useful to me, believing that they will be of value to you.

It must always be remembered that devices for moving raw material or stock in process must be subservient to the general organization and any method employed must be considered as an auxiliary thereto.

Unnecessarily high costs of handling are fre-

quently due to not recognizing the aggregate amount of, and in not securing the savings that can be made from, the many relatively small economies possible in the handling of the material in the numerous transfers that make up to the total cost. The analysis of any problem is but the application of fundamental principles to any situation whether in a small mill or in a group of extensive mill buildings.

OBJECT OF THE PAPER

The object of this paper is to call attention to the possible savings in the handling of material, to the commercial apparatus available to secure them, and briefly to indicate a simple method of

THE UNIVERSAL TWO WHEEL TRUCK, THE STORAGE BATTERY ELECTRIC TRUCK AND VARIOUS FORMS OF HAND TRUCKS IN DAILY USE

examination that will help the manager in determining—

1. Where he can save in handling.
2. How much he can reduce the labor costs at these points.
3. What investment will be remunerative.
4. Will these changes pay, and are they in line with future development of the plant.
5. What commercial apparatus is best to accomplish the results in any particular case.

There can be no hard and fast rules for work of this kind. It requires an intimate knowledge of apparatus available, a careful collecting of the facts of operation, and the exercise of good judgment and creative imagination to see the arrangement of apparatus that will effect the desired results, and at the same time fit in with the existing conditions of operation.

The writer herein outlines a method that he has found helpful in marshalling the facts for his decision and recommendations. Conditions will vary and all the details cannot be foreseen or discussed in a paper of this kind.

WHERE CAN EXPENSES BE REDUCED?

Usually wherever more than one man is employed in the transfer of material from one point to another, and wherever the physical effort is greater than one man can perform. Conservation here means reduction of the human physical effort —doing the work with a cheap power and utilizing the man's intelligence to direct the application of this power to his full supervising ability.

Where the above conditions exist and commercial apparatus is available to do the work it justifies further study. It may pay to install apparatus and it may not, depending on (a) constant or intermittent work; (b) the character of the operation itself, and (c) the results of the following analysis.

HOW MUCH CAN BE SAVED?

If the conditions described in the previous paragraph can be improved by the use of commercial apparatus, we can determine how much labor will be required by the proposed method, and the probable labor saving effected.

Assuming we have planned a good working arrangement of commercial machinery to do the work, we can readily estimate the cost of the necessary apparatus.

This will, of course, depend on the plans suggested and the needs of the situation, and can have no definite discussion here.

WHAT INVESTMENT IS JUSTIFIABLE TO EFFECT THE SAVING?

This is the item in the investigation that is the most difficult of analysis, as it has so many vari-

ables. The figures obtained by the following method are only an indication of facts and the ultimate decision must be dictated by good judgment and a general consideration of the whole situation.

The variables are many in the work to be performed—the work may be of temporary character, infrequently done, the amount fluctuating widely, or it may be a regular daily operation year in and year out. This item varies from 0 to 100 per cent.

If of a temporary nature no saving can be made, whereas if of daily need for the future, the whole saving of the reduced labor by the plan suggested is available. The true value exists somewhere between these two extremes.

AN ELECTRIC OVERHEAD TROLLEY FITTED WITH GRAB BUCKET LOADING A LARGE POWER TRUCK

It need not be difficult to assign a value to this item after thorough observation and careful consideration. Let us call it X—a percentum.

The variables in the investment value may be classed as follows:

Interest charges on investment—A per cent.

Interest to provide for upkeep of apparatus installed—B per cent.

Interest to provide for depression due to age—C per cent.

Interest to provide for progress in the art of the particular device proposed (i. e., subsequent inventions)—D per cent.

Interest to provide for extension to service—E per cent.

Additional superintendence and overhead expenses due to change in method—H per cent.

Cost of power, supplies, and other variable items in dollars per year—F.

These eight items comprise the necessary charges that must be considered and each of them can be approximately determined by one familiar with the apparatus selected and the operating conditions. While in any particular case any of them may vary, the total can be determined with approximate accuracy.

We now have the elements of a test formulae which determine the amount of profitable investment:

Let S = the yearly saving in labor in dollars and Z = the investment in dollars justified by these considerations, then

$$[S\ (X \text{ per cent.}) - F] \div [(A + B + C + D + E + H) \text{ per cent.}] = Z.$$

Assume as a test case, four men are employed day in and day out in moving coal, lumber, cotton, or any other material from one point to another. And assume that a commercial apparatus (electric truck, narrow gauge railroad, conveyor, etc.) will do all the work of these four men with one operator.

The foregoing paragraph and those following are not intended to represent any typical instance as to conditions of operation or values selected for the variables, but merely to make clear to the eye the method employed.

Assume we pay the men $2.00 per day each for three hundred days per year:

Labor reduced $1,800.00 per year.

Assume X = 80 per cent. Plant operated 1 shift, the men employed 80 per cent. of the year.

A = 6 per cent. Interest on investment.

B = 6 per cent. Upkeep.

C = 15 per cent. Depreciation.
D = 10 per cent. Anticipating more economical machinery for same purpose in the future.
E = 3 per cent. Extension to service.
H = 3 per cent. Additional supervision required.
F = $400.00 cost of power, etc., per year.

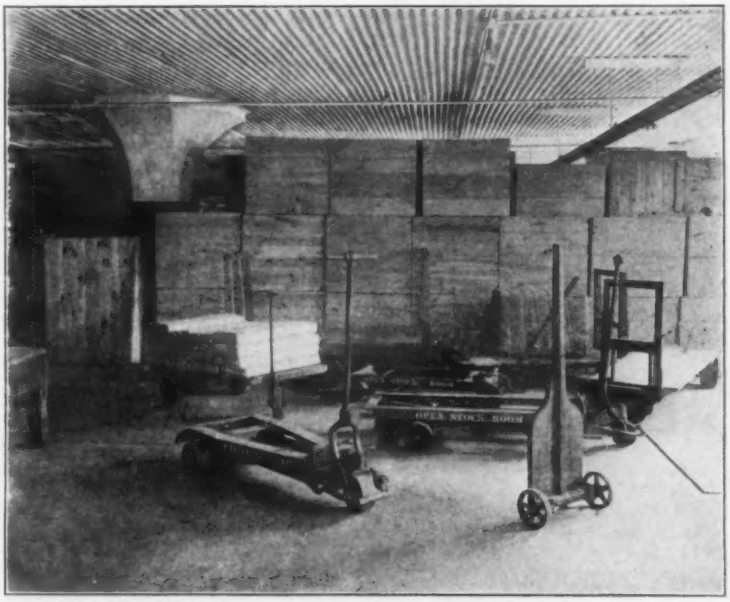
[$1,800.00 × 80 per cent.] — F ÷ (6 + 6 + 15 + 10 + 3 + 3) per cent. = Z.

($1,440.00 — $400.00 = $1,040.00) ÷ 43 per cent. = $2,420.00 = Z.

B = 6 per cent. for repairs and upkeep.
E = 3 per cent. for minor extensions and equipment.
H = 3 per cent. additional superintendence.
F = $400.00 cost of power, etc.

and that in four years, it creates in addition to the above a reserve equal to the whole original investment for a renewal of the apparatus, or the purchase of a new device that is more economical in use.

The writer finds the above method a simple,



SPECIAL TRUCKS FOR HANDLING BOXES AND PACKAGES

WILL THIS CHANGE PAY?

Our investigation indicates that an apparatus costing less than $2,420.00 can be installed that will be kept in good condition—earn interest on investment and provide reserves for depreciation, obsoleteness, etc., and show a saving. If the apparatus (assume an electrical storage battery industrial truck) will cost to install I = $1,750.00—the expense charge will be

I (A + B + C + D + E + H) per cent. + F or
$1,750.00 × 43 per cent. = $752.00.
$752.00 + power (F $400.00) = $1,152.00.
Labor saving = S = $1,800.00 — $1,152.00 = $648.00.

An actual saving of $648.00 per year—a return of 36 per cent. on the investment—over and above all interest charges, upkeep, deterioration and obsoleteness.

It follows from the relation of the equation that it provides yearly:

A = 6 per cent. interest on the investment.

workable one that tells with reasonable accuracy the savings by the methods proposed, the risk of the investment and the provisions made for the future, and enables him to see the situation with increased clearness.

In other words, it is comparatively easy to decide whether or not to proceed with any plan—if the following facts are clear.

The total cost of the investment required, when it earns a fixed interest on the investment, provides—

A fixed amount for upkeep,
A fixed amount for extensions,

for the power used, and creates a fund that will write off the whole investment in 100 ÷ (C + D) years, and provides a probable saving over and above the foregoing of a definite percentage on the original investment.

To the writer's mind the method described does make clear the above facts and is therefore a useful tool.

CAN THE MONEY FOR THE PROPOSED CHANGES BE USED TO BETTER ADVANTAGE ELSEWHERE?

Having determined the probable saving as outlined above, these questions can be considered in detail where the particular needs of the plant are known and then only by the manager. The plan proposed must be subservient to the general organization. It does not permit of discussion here.

THE COMMERCIAL APPARATUS AVAILABLE TO IMPROVE THE ECONOMY IN HANDLING

For reasons of clearness in this article I have discussed the above items first, but these same conditions cannot be properly considered without knowledge of the apparatus available, some of which are discussed in the following paragraphs.

A wise conclusion as to the best layout and as to the apparatus most suitable can only be made by one intimately familiar with the various apparatus, their limitations, effectiveness and suitability to the work in hand.

There are so many types of apparatus manufactured each of which has advantages of its own and a limited area of economical application determining its use or rejection for any given condition, that an opportunity for the exercise of judgment is always present and important. The general arrangement of the plant, the type of apparatus, the manufactured product which is most acceptable and economical when first cost, area required, upkeep and operating charges are considered, are matters for careful consideration.

In handling the raw material, supplies and stock in process, various types of hand trucks are used varying from the original two-wheel hand truck by many ingenious modifications to the latest form of electric storage battery industrial truck.

Fig. 3 shows a group headed by the oldest form of two-wheel truck in use and the latest development, the storage battery electric truck, and behind them various forms of hand trucks that are in daily use. It illustrates very well the development of trucks used inside mill buildings.

An interesting comparison of the primitive hand truck and one of the successful electric trucks is shown in Fig. 3.

Various forms of hand trucks that are in daily use, each having its particular field of economic use, are shown in Figs. 3, 8 and 10.

POWER TRUCKS OF VARIOUS DESIGNS

Overhead trolleys of various types from the simple hand operated trolley and lift to the electrically operated grab bucket trolley are available for service in their respective fields and usefulness.

There are several tiering machines in the market for stacking merchandise that can be utilized in specific work where the storage area is not great enough to necessitate the constant movement of the device from room to room.

Narrow gauge railways with cars operated by hand or electric storage battery locomotives are particularly useful when the loads are heavy and the line of motion is well defined between a few terminal points.

The suction and blast systems of conveying cotton with their careful fire protection are well known.

The various forms of slat and belt conveyors are used for handling cotton, and similar devices are used in other industries for handling pack

ages, boxes, etc.

Vertical elevators arranged to carry the hand and electric trucks are commonly used, and there are on the market many forms of vertical and inclined elevators for automatically lifting and lowering packages of all kinds.

The spiral chutes for lowering and the roller conveyors for translating at a slight downward incline may have their application to certain specific cases.

In the mill yard transportation the hand truck, horse vehicle and various forms of gasoline and storage battery electric truck, have each their economic place, as well as the narrow gauge railway and the standard 4 feet 8 1/2 inches gauge railway with its cars and locomotives.

COTTON TYPE STANDARDS

BY EDWARD K. CONE,
President New York Cotton Exchange, New York City

Until the United States Government Standards of cotton were established by Act of Congress and were promulgated in 1909, there had been no generally recognized standards of cotton in the United States other than those established at a convention of American Cotton Exchanges held at Augusta in 1874. At that meeting where some eighteen associations were represented; what was then known as Standard American Classification, but which has since come to be best known as the New York Cotton Exchange Standards, were established. Gradually the various exchanges commenced to depart from the standards then made, excepting the New York Exchange, which has steadfastly adhered to them until this year.

In June, 1913, there was an International Convention of Cotton Exchanges at Liverpool. There were at this meeting, in addition to the eighteen members of the Liverpool Committee, delegations from the Bremen and Havre Cotton Exchanges, the Manchester Cotton Association, the International Federation of Master Cotton Spinners and Manufacturers and delegates from twenty American Cotton Exchanges and Associations. This meeting, therefore, may be fairly said to have represented fully the cotton buyers of Europe and the cotton merchants of the United States. The unanimous sentiment of the meeting was that an International Standard of cotton was a necessity and that this necessity was perhaps best met by adopting the Liverpool Standards with certain changes in the lower grades. A further meeting of American Exchanges was held at Washington later in the year and representations were made to the Secretary of Agriculture that the trade represented there in convention would prefer the newly established International Standards to the United States Standards as adopted in 1909.

The advantage of a standard known and used generally throughout the world is of course self-evident and the New York Cotton Exchange has since the convention of 1913 used its best endeavors to have the new International Standards adopted. Failing in this effort, it has now formally adopted the United States Standards as existing and all contracts maturing on and after April 1, 1915, will be based on them. It is impossible, of course, to provide for their use on existing contracts, as the value of these contracts would be thereby affected. There is, however, a strong element in the Exchange favoring the institution of a second contract that would permit of putting into earlier use a contract that would not only have the United States Standards as their basis, but also the other changes recently made in the rules of the Exchange, such as monthly revisions based on commercial differences and twenty-five pounds of tare instead of twenty-eight pounds. The probabilities are that such a contract will be devised and shortly offered to the members for their consideration.

The adoption by New York of the United States Standards leaves therefor for our present consideration only this standard and the "International." A comparison of the two seems to find them very close, on the grades of Middling or above, the divergence becoming quite apparent on Strict Low Middling and Low Middling, where the proposed "International" is slightly higher as regards leaf and trash, but inferior as to color and uniformity. The Good Ordinary boxes of each standard are very nearly on a par as far as leaf is concerned, but entirely different as to character and color. In making the United States Standards, the aim has been to make each type in a box exactly like the others and to make each grade a precise step from the grade above or below, but all of uniform color. This has resulted in the lowest grades, of standards that do not seem to conform to commercial usages where the lower grades, especially Good Ordinary, should by trade custom be entitled to carry slight additional color, especially cotton of a bluish or grayish cast. This bluish or grayish cotton is likely to occur almost anywhere in the belt, but it is most frequently found in Atlantic States upland. This character of cotton sells generally as white cotton, and that its spinning qualities are such as to warrant it being so regarded seems to be proved by recent spinning tests made by the United States Department of Agriculture.

The idea of making spinning tests of cotton for the purpose of ascertaining comparative values of the various grades was perhaps original with the late George W. Neville, who as far back as 1910 obtained such a test through the courtesy of the Clemson Textile School, with the following result for waste per cent.:

Good Middling	9.03
Middling	13.68
Low Middling	18.64
Good Ordinary	32.30

The Department of Agriculture became interested in the subject and has been making an investigation, recently publishing the results. These are the only data on the matter of which I have any knowledge.

It must be remembered that the Government tests are made with a certain number of pounds of cotton, whereas the Clemson School tests were

made from complete bales. There should therefore be deducted 5.5 per cent. to compensate for tare. In addition an allowance is to be made for the fact that the Clemson School used cotton of New York Cotton Exchange standards, whereas the Department's tests are made from cotton of United States Government standards. These tests have not been extensive enough to be conclusive, but as they stand they show a curious difference, as far as waste is concerned, in Upland cotton on the higher grades, but a still more pronounced difference in favor of Western cotton on the lower grades. I would also point out to you the remarkable and unexplainable gain in breaking strength on the lowest grades of Upland cotton yarns when bleached.

It will readily, therefore, be seen why the exclusion of this cotton, as it is now excluded by the United States Standards, seems to be not justified, and the reason why the general approval of this standard has been so long withheld, and especially why New York, which so largely draws its cotton from the Atlantic States, has felt that an injustice has been done in outlawing this cotton.

There is now pending in Congress a bill that if passed will permit the Secretary of Agriculture to make changes in standards and to establish grades of tinges and stains. I hope and believe that if this authority is given him, and that if, further, there were to be authorized standards of "Blues" to take care of cottons so prevalent in the Atlantic States, we shall have at last a standard that will in the white grades approach more nearly the proposed "International," and will prove, when supplemented by standards for color, more satisfactory generally than any standard that has heretofore been established.

(Continued on Page 186)

The Boston Textile Machinery Exhibition

The fourth exhibition of textile machinery, held under the auspices of the Textile Exhibitors Association in Boston from April 27th to May 2nd, surpassed the expectations even of those who had the highest hopes of what it would be. When the plans were first announced, showing that the entire Mechanics Building had been engaged, there was some doubt as to whether such ambitious plans could be successfully carried out, but the enthusiasm of the management with the cooperation of all the members of the association brought about the largest and most comprehensive display of this nature ever held anywhere in the world. Former exhibitors were represented almost without exception, in most cases taking larger spaces, showing that previous experience had been satisfactory, and many late applications for space had to be turned down.

These exhibitions have become a regular feature of the trade, affording as they do a convenient means of becoming acquainted with the recent machinery and process developments by actual inspection in operation in a few hours which could not be done otherwise.

The large attendance of the leading men of the industry showed the importance which the Textile Show has now assumed. Manufacturers, agents, superintendents and overseers came from all parts of the country. The South was well represented. The American Cotton Manufacturers Association changed the date of its meeting so as to make it more convenient for those in attendance at the convention in New York to come on to Boston and most of them availed themselves of the opportunity. Some mill superintendents and overseers who had never been North before embraced this chance to visit Boston. The Middle and Western States sent their representatives and a large delegation was present from Canada. New England of course was well represented by hundreds of visitors from the mill cities and towns. Some manufacturers from the South as well as the North sent their superintendents at the company's expense.

The outside public showed more general interest than at any previous exhibition and on Thursday, Friday and Saturday the afternoon and evening attendance was so large as to crowd the ample aisle space. The convention days, Wednesday and Thursday, naturally brought out the largest number of prominent mill men.

While the exhibits of cotton manufacturing machinery predominated, there were a number of exhibits of woolen machinery and several of knitting machinery and the exhibitors of these classes expressed them-

selves as well satisfied with the results of the exhibition and the number of customers who were in attendance. Many of the different exhibits displayed signs "sold" at the end of the week and a good many machines were shipped direct from the hall to their new owners.

The extent and completeness of the exposition, the smooth running of every feature and the attractive decoration of the hall reflect the highest degree of credit upon the management, particularly upon Chester I. Campbell, to whose skilled direction much of the success is due. He has been ably supported by the Board of Directors of the Textile Exhibitors Association, who have received many congratulations upon the way in which their early plans of ten years ago have been successfully developed and year by year finally culminated in this wonderful show.

General View in one of the Exhibition Halls

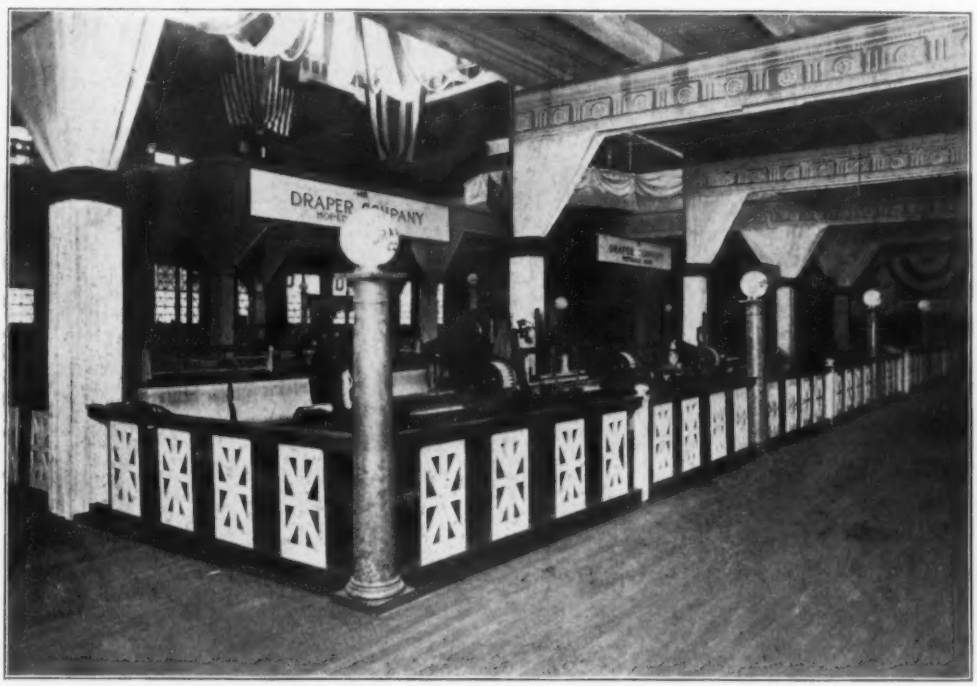
The Board of Officers of the Textile Exhibitors Association is as follows: F. H. Bishop, Universal Winding Co., President; E. F. Hathaway, American Warp Drawing Machine Co., Vice-President; Chester I. Campbell, Treasurer and Secretary; C. A. Chase, General Electric Co.; L. W. Campbell, Woonsocket Machine & Press Co.; G. P. Erhard, Stafford Co.; Charles F. Hutchins, Crompton & Knowles Loom Works; E. H. Rooney, Whitin Machine Works; L. E. Tracy, Louis E. Tracy Co.

The extent of the exhibit and the numerous different displays of interesting machinery makes it impossible in the limited space available to do more than give a brief description of the important features of each display. The pictures give a good idea, although many of them cannot do justice to the exhibits themselves, as the photographers were not always able to get the right light or the right position from which to get the best view.

The exhibit of the Draper Co., Hopedale, Mass., surpassed the record of previous high standards set by this company at other exhibitions. It occupied over 2,000 square feet of floor space in approximately the same location as they have used before in the center of the East Hall. The picture shown does not do it justice because the photographer could not find a position which would take it all in, but a general idea may be had of its impressive size, attractive arrangement and completeness of display. The looms and other machines were grouped around the outside of the space near the rail so that they could be easily inspected by those in the aisles while those who desired a closer view had ample space inside and around the different machines. The center of the space was fitted up as an office and reception room where one or more of the following gentlemen were usually to be found: F. J. Dutcher, president, W. I. Stimpson, agent; C. E. Nutting, general superintendent; W. S. Pepperell; P. C. Wentworth; J. D. Cloudman, Southern agent; F. E. Forster and William Haynes of the Southern office were also present. The machinery exhibit included eight Northrop looms, a twister, one spooler, two beam warpers, one warper with balling machine, one single thread yarn testing machine, and samples of various smaller articles. The looms were as follows: One M Model, 40 inch loom, for making fine goods, using 6 3/4 inch filling battery with cop filling. One E Model, 36 inch loom, with filling battery for 8 3/4 inch bobbin with extra large diameter; high roll take up, Roper let off, single filling fork; single thread warp stop motion, Lacey overhead harness motion arranged for four shade work. One P Model loom for 36 inch goods with filling battery for 8 3/4 inch bobbins, extra large diameter; high roll take up; chain friction let off; single filling fork; feeler; single thread warp stop motion; overhead spring harness motion arranged for four shade weaving. One K Model loom for 36 inch goods with 7 3/8 inch filling battery using cop filling. It has high roll take up with Nutting improvement chain friction let off; Durkin Preventer; single filling fork, feeler single thread warp stop motion; 20-harness Crompton & Knowles dobby or Stafford pattern. One 90 inch L Model loom with battery for 8 inch bobbins, high roll take up, compound let off, single filling fork, single thread warp stop motion, roll and shaft harness motion, Dutcher temples with 4 1/4 inch rolls. One 36 inch H Model loom for corduroy weave, special selvage temple. One 40 inch E. Model loom, with filling battery for eight inch bobbins, roll and shaft harness motion for two shade weave. One 30 inch E Model loom with battery for 8 inch bobbins, steel harness warp stop motion, high roll take up, Roper let off, single filling fork with special feeler, using Straw's patent shuttle and feeler devices, steel harness warp stop motion, roll and shaft overhead work. All the looms were driven by General Electric independent motors.

They also showed a twister, with tape driven spindles using Rhoades patent compensating device, one side of machine arranged for wet twisting, the other side for dry twisting with Rhoades patent novelty yarn equipment. One L Model spooler with tape driven spindles with Rhoades patent compensating device for the spindle tapes; bobbin holders partly for standard friction and part with center draw for fine yarn; thread guides of the improved Northrop; the MacColl and the Lawrence patterns; a warper and balling machine with lease comb and leasing motion; a warper for very fine yarns with cone motion; ball bearings on the rolls, and construction throughout to give the best results with fine yarns; a warper for coarse yarns with cone motion and beam doffing device; back reed and front comb; warper clock; beam with 32 inch head and 9 inch barrel. This warper is recommended for coarse work where it is important to obtain the greatest possible length of yarn on a beam consistent with handling the beam in various machines. The attendant at the exhibition was prepared to test samples of yarn on the Moscrop patent single thread yarn testing machine shown for testing various numbers of yarn from 15s to 9s.

Among smaller devices the exhibit included samples of the Morrill slasher comb, the Rhoades patent double dent slasher comb; various spinning and twister rings; spindles with and without centrifugal clutch; also Draper spindles with the Rabbeth spring cushion bearing; samples of the several spooler thread guides; Duckworth patent traveler boxes; Northrop loom shuttles and bobbins of several standard commercial patterns; also cop spindles for Northrop looms, etc. It was well planned and with ample space for comfortable inspection of the many attractive features.



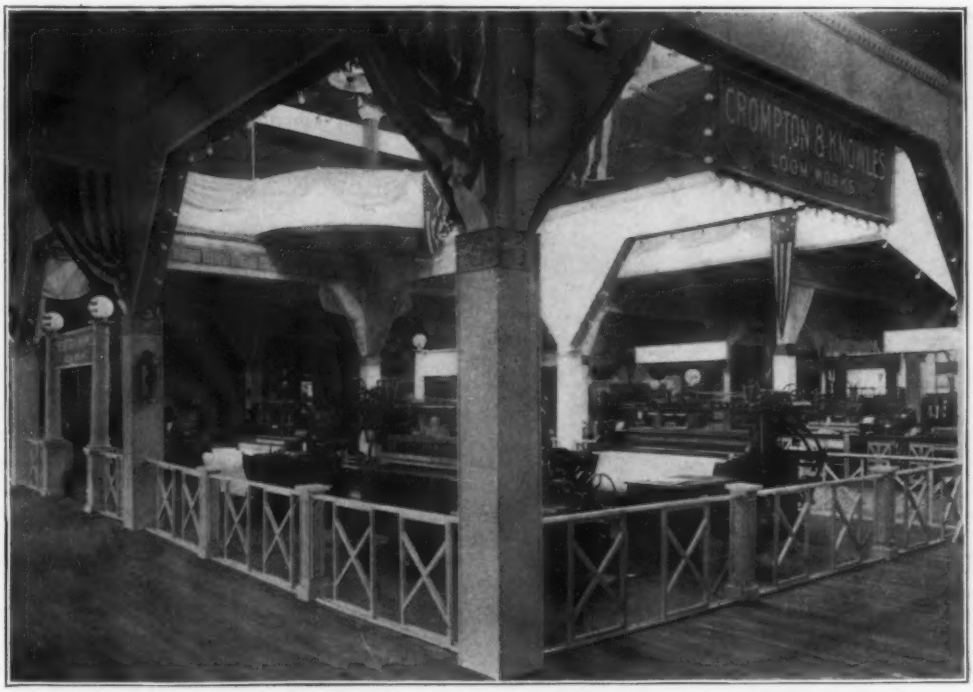
The Draper Company

The Universal Winding Company, 95 South St., Boston, Mass., secured an entire section in the large exhibition hall in order to make a showing of its machines in their varied application to all classes of textiles and for a wide variety of purposes and had on exhibition thirteen distinct types of machines in operation. Several of their standard machines are exhibited with various improvements and special attachments, and in addition to these there are special machines which have never before been shown. Two of these machines mark a departure from the "Universal," or "Precision" wind, but retain the special characteristics of uniformity in operation of machines combined with scientific handling of the material. The new "Progressive" machine designed for doubling fine yarn for twisting is a radical departure from established lines. In the "Progressive" machine the yarn speed is uniform, being controlled by frictional contact of the roll which imparts rotation to the package and in this respect is similar in principle to winding machines of the friction type. Here, however, the similarity ends as, by means of special mechanism, the speed of the thread guide is gradually retarded as the package increases in diameter, building a compact and uniform

package similar to the "Universal," and containing approximately the same quantity of yarn for a given size of package. By the use of the Universal tension devices the yarns are laid under perfect tension control, insuring perfect alignment and delivery to the twister spindle. A gradual reduction in the speed of the yarn guide prevents the slipping and rolling of the yarn at the end of the traverse. These elements in combination enable the machine to be run at a much higher speed. It attracted much favorable attention as being a radical departure from previous methods of doubling yarn, which from tests made of its product should prove a step forward. Another new machine is for the winding of magnet coils. This is a combination of the ordinary spool or concentric coil winding with the "Universal" method. In this machine two guides are employed, one which conveys the wire to the spindle to deposit it in close concentric coils of wire; the other guide on the reverse side of the spindle carrying multiples of very fine cotton yarn, winding according to the "Universal" method of cross winding, the guide being speeded much higher than the wire guide. The result of this is that the yarn is wound over and under the coils of wire, and not only holds them in position, making a perfect self-supporting magnet coil, but also adds to the insulation of the coil by the interposition of the fine yarn. The machine on exhibition has already been sold, and many orders have been taken for additional machines. The company also has on hand a large order for these machines for export to the Continent of Europe. Other machines attracting much attention for their novelty and utility were the No. 8 machine, winding eleven ends of cotton yarn in multiple form to be used on twisting machines for yarn for the construction of automobile tire fabric. A recent adaptation of the No. 10 silk quilling machine for ribbon quills with mechanism for tapering the ends of the quills in winding was shown in operation, as was also a new grouping of the No. 50 cone winder

The Universal Winding Company

into what is called a "double-gang form" of twelve spindles in place of six. Three gangs of the No. 90 machine were shown adapted for various purposes, one of these being operated continuously on fine spun silk wound in cop form for use in loom shuttles; another adapted to the winding of artificial silk on large bobbins for use by the knit goods industry. The exhibition as a whole was extremely creditable and showed that the Universal Winding Company is approaching the goal which it set for itself in adopting the name of "Universal", as it now has a range of machines adapted to practically all the requirements for winding in the textile industry, and which are being distributed throughout the world wherever textile machinery is operated by power. The officers of the company with a large staff of assistants from the mechanical department and branch offices were in attendance.



The Crompton & Knowles Loom Works

The Crompton & Knowles Loom Works, Worcester, Mass., occupied a very large space near the center of the hall which showed by its general arrangement that a well prepared plan had been successfully carried out. There was plenty of room around the looms for the interested mill men to go inside the rail and get near the machines without crowding. The looms were all automatic magazine and kept working away without attention except as visitors were shown the particular features designed to be brought out. There was plenty of room for the visitors to rest and the general atmosphere of comfort as well as the interest of the looms exhibited made this a very attractive space. Of their automatic gingham loom the company showed two types this year, a two-color and a six-color. There are thousands of these looms in successful operation, and they are built in two, four and six-color capacity. Their terry towel loom was equipped with a four-color magazine, three cells of which are used for the ground or body of the towel, thus allowing for a large

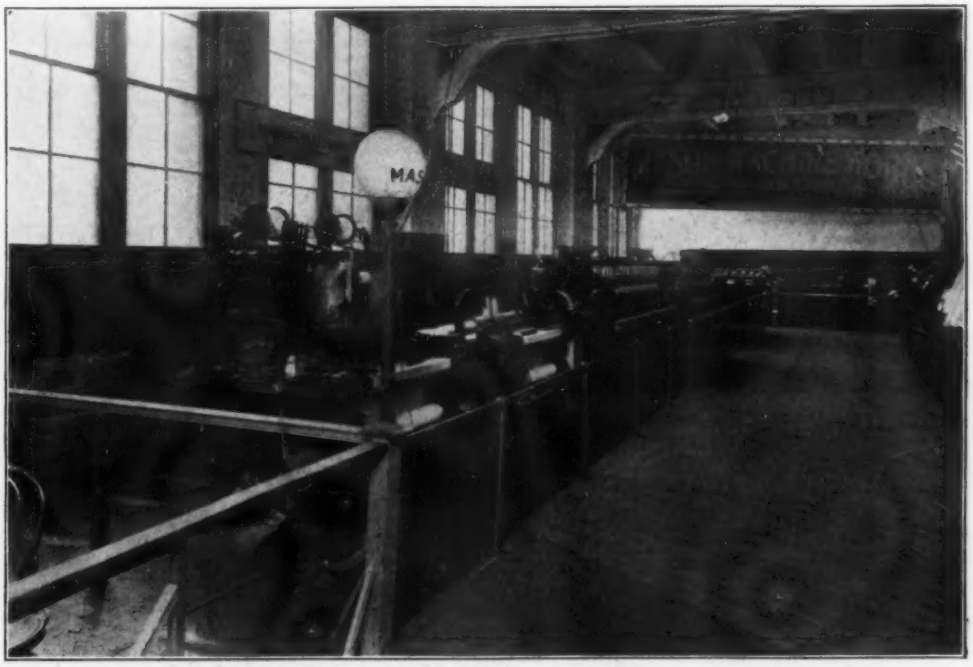
number of reserve bobbins, and the fourth cell for the border. A cotton blanket loom was shown running with three colors, with a Jacquard controlling the pattern, weaving a figured blanket, and presenting a practical illustration of the wide range of work for which the automatic loom is adapted. The duck loom differed from the others exhibited in that the shuttle is automatically changed, instead of the bobbins, upon the near exhaustion of the filling, and this change is made without loss of production, as no picks are lost in making the transfer. A 2 by 1 box, 25 harness, intermediate worsted loom was equipped with the well-known Draper magazine. The warp and filling used in this loom were furnished by S. Slater & Sons, Inc., of Webster, Mass. A 4 by 1 box, 20 harness, heavy worsted loom, having a vertical magazine to hold four colors, was shown producing high grade suiting, warp and filling for which were furnished by the W. E. Tillotson Manufacturing Co., of Pittsfield, Mass. C. F. Hutchins was in personal charge and he and his staff received many congratulations. Besides Mr. Hutchins we noted Messrs. T. T. Booth, Gay Thayer, F. W. Howe, C. R. Howe, Benj. McGinnis, as well as Sidney Alexander and Edwin Garsed from the Southern office.

Saco-Lowell Shops, Newton Upper Falls, Biddeford and Lowell, occupied a large and finely located space near the entrance, using several times the space of the last exhibition. They showed a line of up-to-date machinery consisting of 40 inch card with apron delivery, a lap winder, a drawing frame, and a new model spooler, 40 spindle; a 140 spindle spinning frame, and their latest improved heavy twister for tire ducks and similar heavy fabrics, and a 16 spindle camless winder. The exhibit was a most popular one and always surrounded by mill men who were investigating the new models and recent improvements, some of which were shown here for the first time. Among those of their organization present at different times were R. P. Snelling, treasurer; J. C.

The Saco-Lowell Shops

Howe, vice-president; F. J. Hale, agent, and Messrs. Blake, Wakefield, Lord, Haven, Broadfoot, and James Strang.

The exhibit of the Mason Machine Works, of Taunton, Mass., occupied a large space. All of their machinery was operated by electric motors and as nearly like cotton mill conditions as possible. A new model revolving flat card was shown, which, while it will contain no radical departure from their well-known older type of card, embodies certain improvements. The new card has been lowered, making it easier of access and operation. A new grinding method, based on well tried principles has been adopted and a front apron designed to simplify the mechanism and reduce the amount of cleaning and attention from the operator. The drawing frame exhibited was the standard Mason drawing frame. A new back plate has been made which makes the frame easily attended by young persons of low stature. Two spinning frames were exhibited, a warp frame, spinning 40s warp yarn, operated by a varying speed motor designed by the General Electric Company, with a view of improving the spinning conditions throughout the build of the bobbin. Starting at a moderate spindle speed this motor will gradually increase the speed of the frame throughout the entire doff. In this way, while the spinning is being done on the small diameter of the bobbin when the tension of the yarn by reason of the radial pull of the traveler is at its greatest, the frame is driven at minimum speed, gradually increasing speed as the bobbin fills with yarn and the pull of the traveler becomes more parallel to the ring with the consequent better spinning conditions until the maximum speed is obtained. In addition to the gradually increasing speed from empty to full bobbin a second speed regulation operated by the same speed controlling mechanism increases the speed as the ring rail rises and decreases its speed as the ring rail descends, thus compensating for the greater tension on the yarn at the bottom



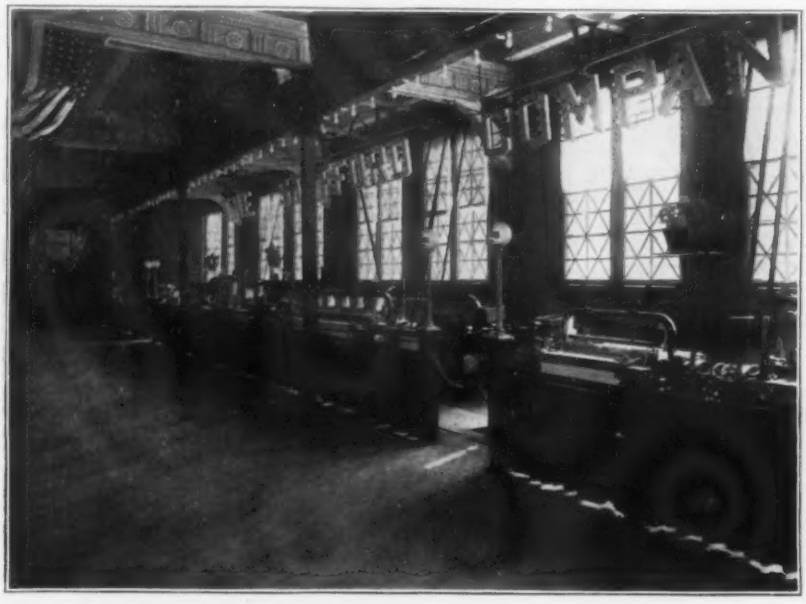
The Mason Machine Works

rail position and taking advantage of the lesser tension on the yarn at the top rail position. The average speeds obtained by the use of the regulator show an increase in production of the frame from 10 to 20 per cent. The gauge of the frame is 3 1/2 inch and tape driven spindles are used. A neat and reliable method of controlling the tension of the tapes has been worked out. Metal threadboards, Dixon's latest type of screw adjustable saddles with reliable traverse motion for the roving are among the interesting details found on the frame. The gearing has been carefully housed in and while the frame is running it is impossible to open the head of the frame and expose the gearing. After the frame has been stopped a safety catch must be operated before the doors in the head can be opened, and while the gearing is exposed the frame cannot be put in motion until such time as the safety lock is put into running position again. The latest type of centrifugal clutch spindles, best quality of rings, case hardened steel rollers, etc., are shown, and in every way an effort has been made to show the great strides that have recently been made by the Mason Machine Works to build a spinning frame replete with the latest and best improvements in the art of ring spinning frame building. The second frame was a standard filling yarn frame, operated by a motor furnished by the Allis-Chalmers Co. gear driving the tin cylinder. Where various numbers of yarn are spun calling for different spindle speeds, the geared method of driving frames where motors are used, presents fewer difficulties for obtaining the changing spindle speeds.

The Office of the Stafford Company's Exhibit

In its details of construction it is practically identical with the warp frame described in greater detail above. An automatic bobbin changing loom with mechanical warp stop motion was exhibited. The loom is a Mason standard loom driven by an Allis-Chalmers motor of the swinging type (specially adapted for driving looms) driving a friction pulley by means of a belt. The loom proper is the well known Mason heavy sheeting type of loom designed to run at high speed. The battery for carrying the filling and the operating mechanism is from the shops of the Hopedale Mfg. Co. The warp stop motion, mechanically operated, is of the single thread drop wire type. One of the claims of the

makers is that the filling changer and warp motion can be applied to existing modern looms as well as in the building of new looms, and that the amount of changing necessary is very slight; this fact will interest users of plain looms. A 16 harness leno weaving loom was shown driven by a General Electric Company motor, gear driven, containing all the latest improvements in dobby weaving and construction. The exhibit proved most attractive to mill men, who



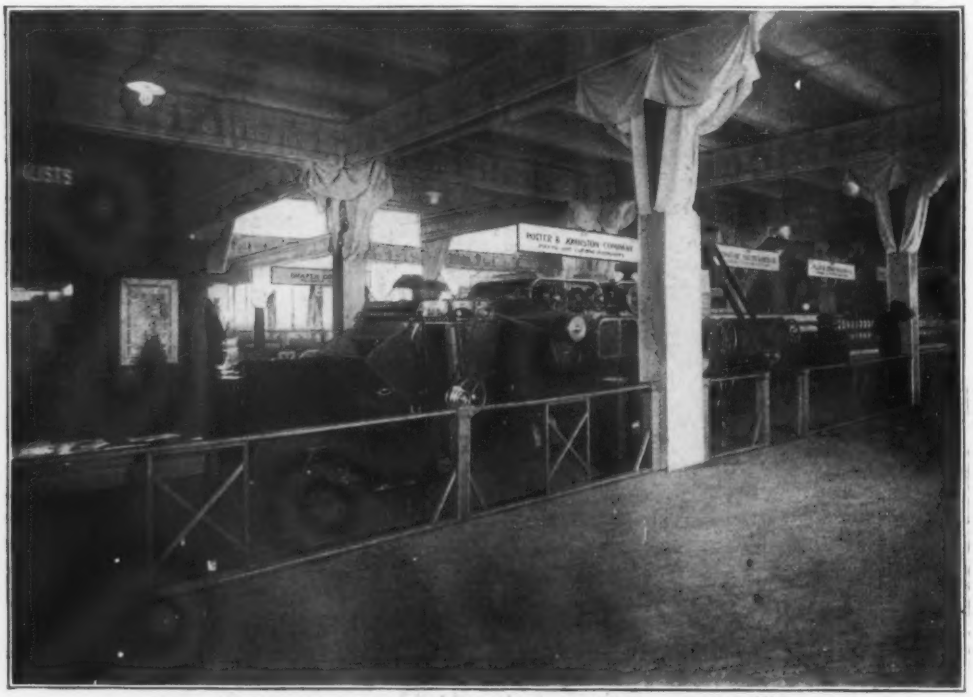
The Stafford Company, Showing Part of Loom Exhibit, With Office at Further End

were much interested in the new features. Thomas G. Cox, the agent, was in charge, with numerous assistants. Arthur R. Sharp, the new treasurer of the company and other officers were present on several days.

The exhibit of the Stafford Co., Readville, Mass., occupied the same position as in previous exhibitions, along the side of the East Hall, but with the addition of a large office space at the end and at right angles to the long line of "Ideal" looms. This is shown in a separate picture as it was impossible to get a single photograph which would adequately show this space. Much taste was displayed in the arrangement of this exhibit. The office was equipped with handsome furniture and rugs; the entrances were flanked by beautiful green and bronze standard lamps; special railings, hung with green cloth and carrying out the general scheme with a dark green cloth background, gold monograms and trimmings and latticed windows, gave a setting to the business-like performance of the machinery which emphasized both. Eleven "Ideal" automatic looms were shown in operation, each weaving a different fabric, some on cop and others on bobbin filling, and one loom was running both cop and bobbin filling in the same magazine to demonstrate the fact that they handle cop filling as readily as bobbins. One of the looms was driven by a direct connected General Electric motor. The others were belt driven from a line of overhead shafting, which was driven by a single General Electric motor so that a demonstration was afforded of both the group and individual electric drive. The looms were as follows: A 32 inch bag loom, 64 by 68, using 24s warp and 42s filling. This loom was equipped with the new Stafford bag motion and was weaving complete bags. A Terry towel loom weaving a handsome Terry

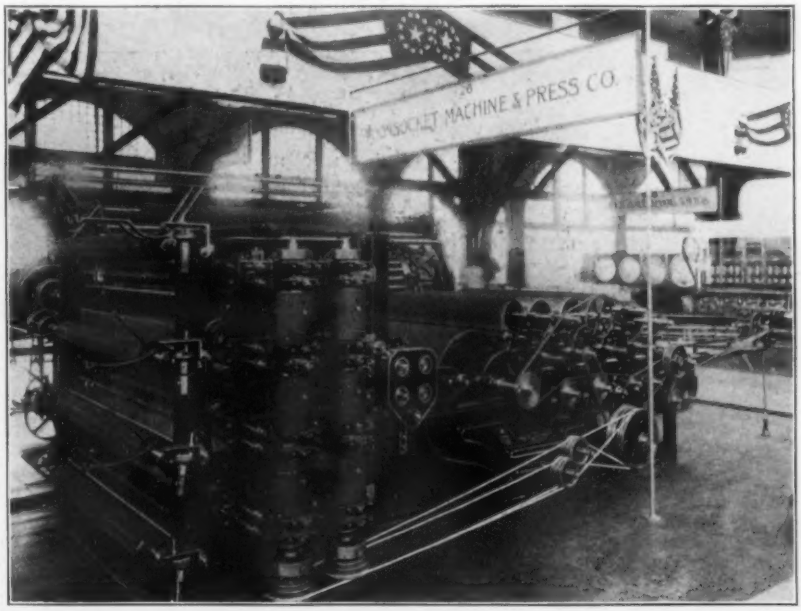
towel with the new improved Stafford Terry motion. The latest model of Stafford duck loom, making a high grade 12 ounce fabric. A denim loom, making a blue denim 64 by 38, 9s warp and 12s filling. A 40 inch sheeting loom, making a sheeting 80 by 80, 28s warp, 44s filling. A 32 inch fine goods loom, making a piece of goods 64 by 64, 40s combed warp and 40s filling. A 62 inch worsted loom, making a piece of worsted dress goods, equipped with the latest improved Stafford positive dobby. A broad sheeting loom, making a 90 inch sheeting, 68 by 72, 20s warp and 28s filling. A 36 inch towel loom, making a cotton towel, equipped with a double cylinder dobby for weaving the border. A 36 inch corduroy loom, making a very handsome piece of corduroy, 36 by 350, 30/3 warp, 21s filling. A 40 inch fine goods loom, making a fine lawn, 60s warp, 70s filling, 72 by 72. This was one of the big displays of the show and George P. Erhard, the treasurer of the company, received many compliments. Other members of the staff present included W. Wm. Smith, sales manager; R. N. Mackay, Fred A. Wilde and Fred H. White, Southern agent.

The "Textile Specialists" occupied a very large space, the machinery of the different builders being grouped so as to show the continuous process of manufacture from the cards through to the warping, beaming and spooling. One unique feature of this exhibit was the closed-in, sound-proof consulting room where visitors could be taken for a quiet chat without being disturbed by the noise of the machinery. The extent and the layout of this exhibit made it difficult to get a picture which would convey an adequate idea and although several frials were made the picture presented fails to give a proper conception of this fine display of machinery from the works of the Potter & Johnston Co., Fales & Jenks Machine Co., Woonsocket Machine & Press Co., Easton & Burnham Co. and T. C. Entwistle Co.



The "Textile Specialists" Exhibit, Including Potter & Johnston Co., Fales & Jenkes Machine Co., Woonsocket Machine & Press Co., Easton & Burnham Co., T. C. Entwistle Co.

The Woonsocket Machine and Press Co. showed their latest jack frame fitted with new chain drive and ball bearing top rolls, which they claim to be the lightest running frame in the world, 200 spindles, 6 by 2 1/2 inches, driven with 1/2 inch belt; drawing frame of patented steel construction, and the Campbell aspiratus for cards. With this device a card need only be stripped once or twice a week. Leon W. Campbell, general manager, together with J. H. Mayes and Wm. Lee of the Southern office were present during the week.



The Woonsocket Machine & Press Co.'s Exhibit, Showing the McBride Card

The Woonsocket Machine and Press Co., Woonsocket, R. I., made a separate exhibit of their new McBride card for carding cotton, waste, shoddy and short staple wools. They showed the finisher and condenser card, equipped with Bates feed. We have recently illustrated and described this important new machine. The exhibit was in charge of C. E. Rogers, who was kept busy answering the queries of many interested mill men.

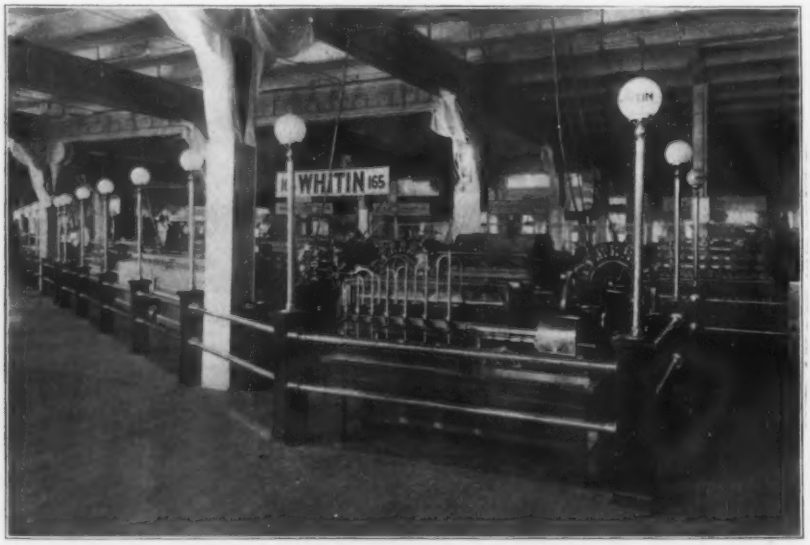
The Potter & Johnston Machine Company, Pawtucket, R. I., showed one of their waste mixing attachments, as described in the new machinery department of this issue, their Style No. 21 double hopper feed, with improved feeding aprons, and single beater breaker. They also included in their exhibit one of their standard 40-inch patented revolving flat cards, with dial setting to one-thousandth of an inch. Since showing this card at the last exhibition they have made many improvements in its construction, including a doffer comb belt drive which offers great advantages, as the speed of the comb changes automatically when the doffer speed is changed, thus insuring the very best of yarn. This card merits close inspection. Mr. Chase was in charge.

The exhibit of the Fales & Jenks Machine Co., Pawtucket, R. I., builders of spinning and twisting machinery, consisted of a 224 spindle 2 3/4 inch gauge spinning frame operating on 1/60s cotton yarn, the frame being motor driven, equipped with ball bearing spindles and flat tape drive, a type of drive exhibited by this company at the Exhibition in 1912. This machine is motor driven, a 3 h. p. motor being used with gear

connection to the cylinder. The machine is also equipped with a steel creel and steel guide board and steel top clearer. Another machine exhibited by them was a 48 spindle, 5 1/2 gauge, 4 1/2 inch ring double roll twister equipped with a tape drive and direct connected motor. Robert Jenks was in charge, with several other members of the staff. Mr. Beede was present for several days.

may be used and its adaptability to different kinds of work; also a reel with all attachments including a measuring device and a small round stand showing different types of spindles electrically driven. Col. Fred Easton was present most of the week.

The Whitin Machine Works, Whitinsville, Mass., devoted their large space principally to an exhibit for the consideration of textile manufacturers interested in the processes



The Whitin Machine Works

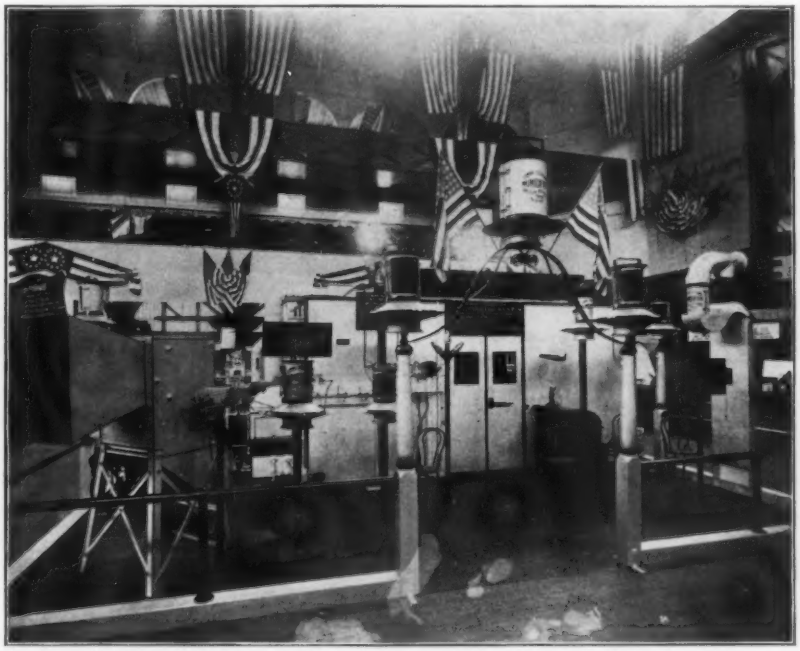
T. C. Entwistle Co., Lowell, Mass., exhibited a line of their various machines consisting of a beam warper, equipped complete with a creel which was arranged with porcelain steps. The machine was operated on 1/50s yarn. This warper was also equipped with their improved open box expansion combs, and with a beam doffing device. Another machine exhibited by this Company consisted of a balling machine, which is used with their ball warper. They also exhibited their traverse wheel and long roll card grinders, which are very well known to the trade. Frank Kenney, president and general manager, was present during the week.

The Easton & Burnham Machine Co., Pawtucket, R. I., exhibited a skein winder showing the different kinds of swifts that

and machinery required for the reclamation of waste. The profitable disposal of the waste products of a cotton manufacturing plant has become a problem of the greatest importance, on account of the high price of raw cotton and the ever increasing labor costs. To meet the demand for a line of machinery for the reclaiming of waste products, the Whitin Machine Works have developed and put on the market machines that are particularly well adapted for such work. There are two principal systems in common use in European and American mills, viz., the coiler system and the condenser system, both of which were exemplified in the Whitin exhibit, showing the machines in operation, producing yarns under ordinary working conditions. The exhibit of the

coiler system comprised a 40 inch revolving top flat card, with breast, fancy roll and eight-coiler front; a 9 by 4 1/2 by 7 inch slubber, with 72 spindles; a ring spinning frame of 4 inch space, equipped with 36 tape-driven spindles, and a twisting frame of 3 1/2 inch space, equipped with 36 tape-driven spindles. The condenser system exhibit included a 48 inch breaker full roller card with automatic feed, and a 48 inch finisher full roller card, with 96-end tape condenser. These two cards, connected by a cross feed, comprise a so-called two-card set. There were also shown a wool spinning frame (Pease patent) with 48 spindles, 4 inch space, and a waste spinning frame (Smith patent) with 48 spindles, 4 inch space, and samples of yarns by Whitin machinery. Of their staff present were noted E. H. Rooney, R. B. Chase, J. A. Cooper, L. M. Keeler and D. O. Pease.

The American Moistening Co. moved into the West Hall this year and occupied a large, centrally located space where their well arranged exhibit attracted a great deal of attention. Frank B. Comins, treasurer of this company, always succeeds in preparing an attractive arrangement and in making each year's exhibit different from the preceding in some important particular. This year a conditioning room was the central feature. This is a large galvanized chamber fitted up for skein yarn, cop or bobbin filling and cones. It is so arranged as to automatically condition the yarn to any desired percentage of humidity or regain. The Comins automatic humidity controller is used in connection with this system. This it may be remembered was exhibited as a new feature at the last show. They showed various types of humidifying apparatus, including the well-known "American" system, also a variety of atomizers of different capacities. One group was arranged on the cluster principle and was controlled automatically so that the heads were shut off when the humidity reached the required point. There were spray nozzles such as are used in the "spray



The American Moistening Company

cooling pond" system. An "Aerofor" fabric dampener for use in cloth finishing was another specialty. In one corner of the exhibit was an illuminated sign case with printed cards showing the names of hundreds of mills using their devices. There were also several Comins sectional humidifier heads, including one showing the various stages of its construction up to the present time and

The Hess-Bright Mfg. Company

the latest model demonstrating the ease and simplicity of inspection. Besides Mr. Comins, John Hill and John Porter from the Atlanta office were present and Messrs. Hague, Goodnow, Ulbrich and Comfort from the Boston office.

The Hess-Bright Mfg. Co., Philadelphia, Pa., exhibit comprised eighteen of the new type Hess-Bright ball bearing hangers, post hangers and pillow blocks. They also had a large size drill press made by the W. H. Leland Company, of Worcester, Mass., and a high speed double spindle drill press made by the same concern. On the high speed double spindle drill press, a single thread of No. 50 Clark's O.N.T. cotton drove the spindle at a speed varying from two to four thousand revolutions from Monday morning until the end of the show. C. S. Dodge, of Lowell, had a picker equipped with Hess-Bright ball bearings on the beater shaft. This complete equipment was running, including the hangers and the machines and a pair of trolley wheels weighing over a ton, with a consumption of power of one ampere, 110 volts being driven by a General Electric Co. motor requiring 1.4 amperes to run it. The total power required to run the complete exhibit, including the loss in motor, is 2.4 amperes. This makes 1.4 amperes to run the motor plus one ampere to run the exhibit, or the above total. J. S. Kunkle was in charge of the exhibit. Wm. V. Lowe, of Fitchburg, the New England representative of the Hess-Bright Mfg. Co., was also at the exhibit, as well as the supervising millwright, A. B. Veith, and his assistant, John Schellenberger. A case of ball bearings was shown in front of the exhibit showing the ball bearings, the size of balls used in this bearing, and also fractured balls of the size that are used in the bearings. Several demonstrations of the new hanger bearing show-

ing its perfect flexibility and adaptability to uneven or bent shafting surprised and interested the visitors.

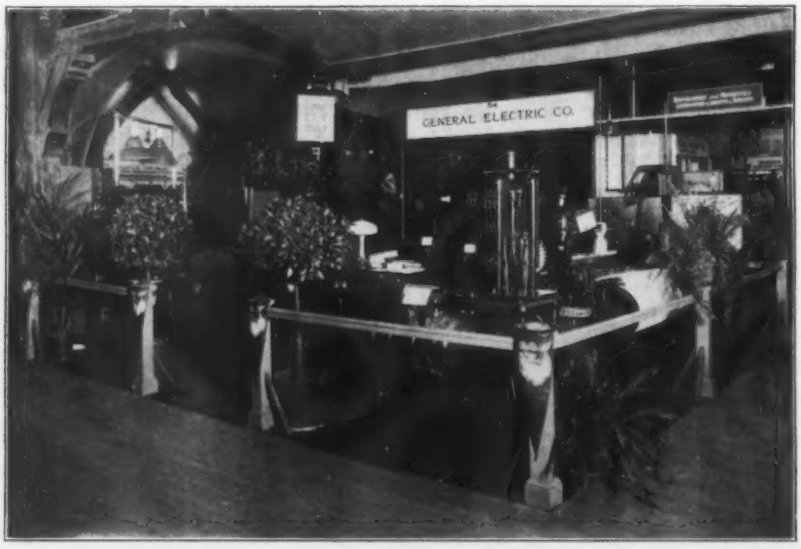
The Textile-Finishing Machinery Company, Providence, R. I., exhibited the Spencer patented skein mercerizing machine for which they are the sole agents in the United States. This machine is described in detail in another part of this issue. While

The Textile Finishing Machinery Company

there have been a great many different mercerizing machines designed and built, few of them have proved satisfactory. The company showed a cotton roll, to represent their roll department, which is one of the important parts of their manufacture. They also showed all kinds of calenders and mangles, which have always been a specialty with them. E. A. Rusden, vice-president; C. F. Tillinghast, W. P. Thompson, W. A. Stilling and Jas. Farrington were present at various times during the week.

The General Electric Company exhibited four frame drive motors, picker motors, spinning frame motors, form L motors and loom motors in operation, with instruments to show their starting characteristics. Cloth loom driven by a variable speed motor which permitted the speed to be changed as desired, giving perfect control to suit the requirements of the work or other conditions. The intelligent and successful study of textile machinery requirements by the General Electric Company was demonstrated by noting the special textile motor applications to be found in the exhibits of the following manufacturers: Potter & Johnston Machine Co., Whitin Machine Works, Mason Machine Works, Woonsocket Machine & Press Co., Fales & Jenks Machine Co., Crompton & Knowles Loom Works, Stafford Company, Saco-Lowell Shops, Foster Machine Co., Universal Winding Co., Easton & Burnham Machine Co., Oswald Lever Co., Draper Company, Davis & Furber. These

showed the practical application of their work to textile requirements.



The General Electric Company

The Brown Spin-Wright Cotton Company

The Brown Spin-Wright Cotton Co., New Bedford, Mass., showed an operating exhibit of a full sized H. & B. 240 spindle, ring spinning frame driven by the Brown Spin-Wright geared spindle drive. This is the same frame which was running successfully for a number of months in one of the leading New Bedford mills. This spindle drive has been so much discussed by spinners who had read about it that they were naturally glad of an opportunity to see it in practical operation and the exhibit attracted much atten-

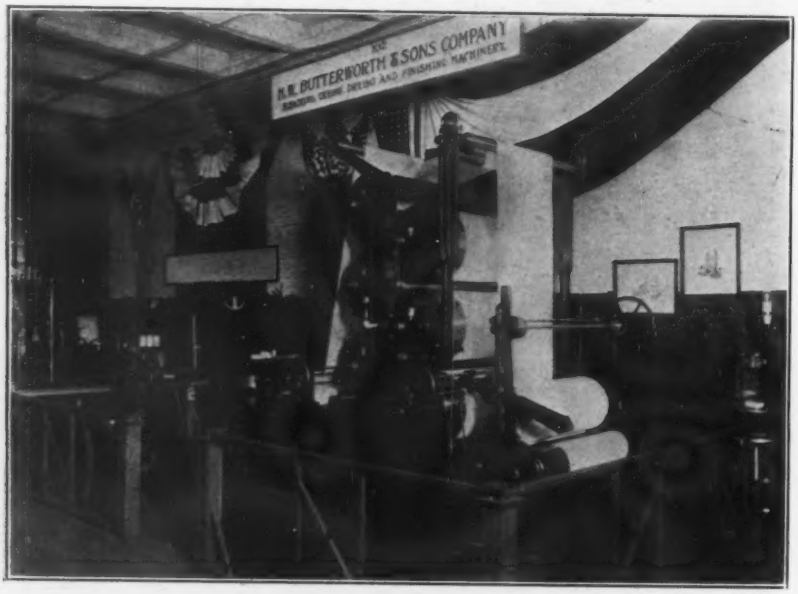
tion. The 240 spindles on this frame are all geared to a single endless perforated metal driving band which runs in the trough upon the spindle rail and drives the spindles positively, all at the same speed. The band, gears and spindles are lubricated automatically. Messrs. Brown and Proudfit of the company were in attendance during the week and were kept busy answering questions. This spindle drive has been described at length in a previous issue of this magazine. Many favorable comments were expressed.

The Carrier Air Conditioning Company

The Carrier Air Conditioning Company of America, New York, had an exhibit comprising a section of a two-story mill building equipped with the Carrier system of air conditioning. Included in this equipment was one of the latest types of Buffalo conoidal fans, designed for very high efficiency in the movement of air, and connected with the fan was a Carrier type "H" humidifier, provided with automatic dew point control. The apparatus was driven by General Electric motors and was in complete operation. The section of the mill illustrated the methods of maintaining the temperature in each department, regardless of conditions in any other part of the building, thus providing with one set of apparatus for the carrying of the various temperatures and humidities best suited to each department of the mill. Each room of this mill section was furnished with a separate Carrier automatic humidity and temperature regulator, with air valves and motors, in complete operation. The Carrier Air Conditioning Company's display, as in past exhibitions, was very interesting, showing the sensitiveness of the automatic controls manufactured by this company, and how mill production can be greatly increased by providing proper atmospheric conditions.

J. Irwin Lyle of the New York office and E. T. Lyle of Boston were in charge of this exhibit.

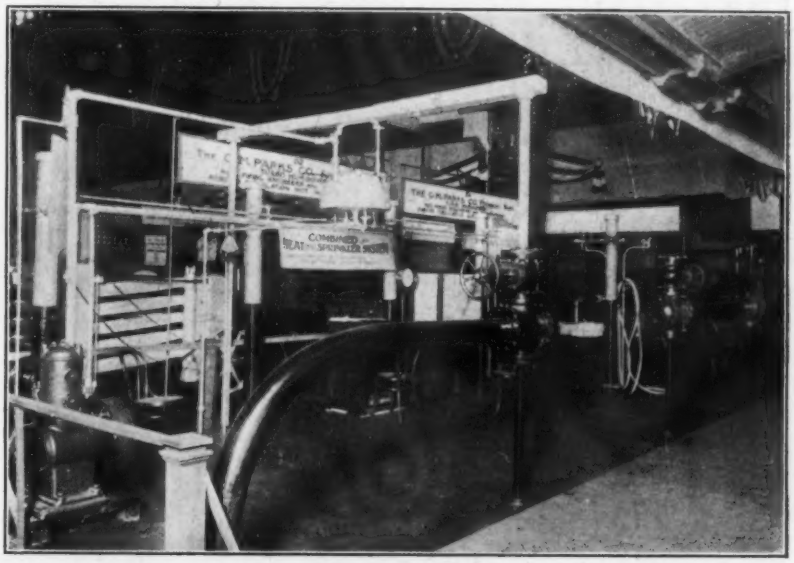
H. W. Butterworth & Sons Co., York and Cedar Sts., Philadelphia, exhibited a drying machine consisting of six vertical cylinders equipped with a Kay & Foxwell guider attached to the front of the machine for the purpose of steering the goods on to the drying cylinders and also a guider of the same make in the back of the machine, used for guiding the goods on to a Simpson automatic winder; the advantage of this method being to steer the goods absolutely uniform to a line, the outfit shown being adopted for two-string work on double width sets of cans. This winder also automatically cuts off the goods which are being wound up and at the same time starts in the new roll without stopping or slowing down the speed of the machine even though it may be from 30 to 120 yards per minute. One prominent feature of this exhibit was a new patent sewing machine for the purpose of sewing an absolutely flat seam to avoid pasting the ends of piece goods together. The machine sews three stitches at one time and trims off each end 3/16 inch from the stitching. It is especially valuable for use on goods which are printed or Schreiner calendered, and has now been in operation for six years, though only recently introduced to the trade. Harry W. Butterworth, the president of the company, was present most of the week, as was also Mr. Freeman of the New England office.



H. W. Butterworth Company

The G. M. Parks Co., Fitchburg, Mass., occupied twice as much space as in previous exhibitions and this year they were in the West hall. The atmosphere in this hall was noticeably better than in the other hall and it is only fair to give the credit to the practical demonstrations of the several humidifying systems shown in this section of the exhibition. The Parks exhibit had a very business-like look suggesting mill conditions. Several installations of "Turbo-humidifiers" were shown, including the new Turbo cluster tank, especially designed to meet the needs of small installations. The rails surrounding their space, formed of various sizes of pipes, reminded the visitor that piping forms an important part of their business. They are

doing a great deal of engineering work in connection with piping for power and heating. They called attention to the combined heating and sprinkler system which they are now prepared to install as licensees under the basic patterns. A detailed explanation of this system will be found in the New Machinery Department of this issue. Members of their organization in attendance at different times during the week were Messrs. F. W. Parks, R. S. Parks, H. M. Parks, A. W. Thompson, B. S. Cottrell, and others.



The G. M. Parks Company

Richards, Atkinson & Haserick, Boston, Mass., exhibited their new combing machine which is constructed on entirely new principles. This machine is built in four heads, each head being fed by two laps. The entire mechanism was built upon a heavily-ribbed foundation plate, to secure absolute rigidity and a minimum of vibration.

The Westinghouse Electric and Manufacturing Co., with a competent staff of representatives in charge of their exhibit, which they called the "Corner of the Great White Way," due to the brightness of its illumination, demonstrated the value of their motors, consisting of all sizes from 1/4 h. p. for light machinery up to 50 h. p. for the heavier types both for direct machine as well as belt drive, also the operation of their automatic starters and oil switches both adapted to motor use. It was the late George Westinghouse who introduced the alternating current system of electrical transmission and later patented the alternating current induction motor which is the prevalent type of power used in transmission by textile mills. Ever since the first patents were secured the Westinghouse Co. has been steadily perfecting the design of induction motors, and they showed the latest development in alternating current motor design—the new type "CS" steel frame motors which were built for service in textile mills and shown for the first time at this exhibition. These motors were displayed with their parts unassembled, laying before the visitors the details of the indestructible rotor, the shafts, bearings, windings, etc. There were also in the exhibit the small textile type motors for loom and spinning frame drive, the control devices for these motors, four frame drive, circuit breakers and auto starters. Westinghouse motors direct connected to various machines were

to be found in the space of many exhibitors throughout the Mechanics Hall. They also showed a full line of incandescent Mazda lamps, including the very latest in lights with suitable reflectors. As a further instructor to the textile trade as to the methods used in the manufacture of these Tungsten Mazda lamps the company illus-

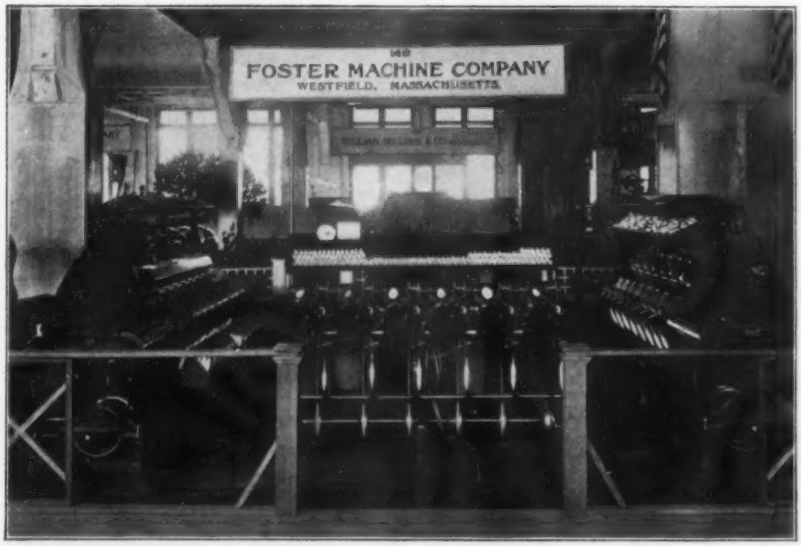
The Westinghouse Electric and Manufacturing Company

Ashworth Bros., Inc.

trated in a large glass case the various parts used in the making of these lights from the raw material to the finished product.

Ashworth Bros., Inc., Fall River, Mass., manufacturers of card clothing, exhibited one of their endless card setting machines in operation making card clothing together with a fine line of samples of different kinds of card clothing.

hibition attracted much attention and was known as model No. 24. It operates on the close wind principle, embodying several new features, one being the independent action of each spindle, so that each may be stopped without the others being affected. E. T. Fowler, treasurer of the company, was on hand during the week, together with T. E. Connor and J. O. McKean.



The Foster Machine Company

The Foster Machine Co., Westfield, Mass., occupied a well located space in the East Hall. They showed their No. 12 model winder for cones and tubes on the open wind principle. This model is built for high speed, the limit being fixed only by the practical speed at which the different grades of yarn should be wound. This machine was equipped with the latest improved devices. It builds up the cone at the big end and provides ample clearance between the side of the cone and the unwinding strand of yarn while knitting. Model No. 25 yarn paralleling winder was shown. This winds two, three or four fold on tubes on cheeses for twisting supply. A new machine exhibited for the first time at this ex-

The mechanical drive for textile mills is worthy of most careful consideration, and the efficiency and adaptability of belts and ropes was well illustrated in the exhibit of William Sellers & Co., Inc., of Philadelphia. Occupying double the space of their previous exhibits, they arranged a series of operating drives rather bewildering to the layman; but a few moments study revealed the ingenious application of a large number of mechanical devices all perfectly correlated and well placed to set forth their practical application to power distribution in the mill. The exhibit was operated by a 5 h. p. D. C. Motor, belted to a line shaft supported on floor stands and pillow blocks. An American system rope drive conveying the power to a

counter, continued on through a series of belt drives, eight in number, and a second rope drive, American system, setting in motion approximately fifteen shafts with guide pulleys, binder frames, mule stands, single post binder frame, tightener binder and a two pulley carrier, operating as a tightener. Each one of these appurtenances was necessary to obtain the proper belt leads. Aside from superior mechanical design, this exhibit was most instructive, demonstrating the correct methods for lining and adjustment, and is ordinarily used by the New Bedford Textile School for this purpose. As cleanliness is becoming more and more a feature in the textile mill, all of the supporting frame work was painted white in order to accentuate the entire absence of leaking or throwing of oil. Drip pans were conspicuous by their absence. Mr. Ancona was in charge with several assistants.

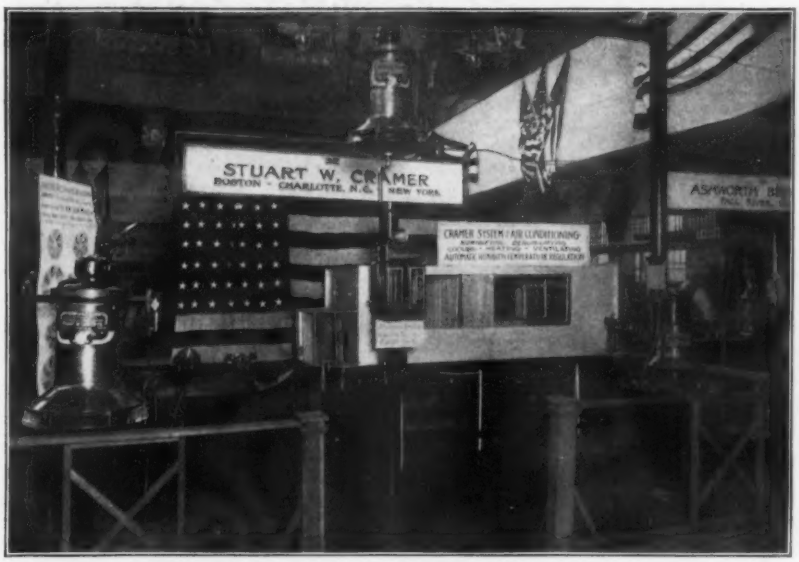
The Enterprise Rubber Co., Federal St., Boston, the New England agents for the Eureka Fire Hose Co., showed a full line of mill hose of various kinds, both canvas and rubber, also other supplies for manufacturers.

Stuart W. Cramer, of Charlotte, N. C., showed various types of air conditioning systems in greater detail and more extensive space than in previous exhibitions. This display consisted of the central power system, ceiling systems, fan air conditioners, spray humidifiers, atomizer humidifiers, automatic humidity and temperature regulators and improved metallic diaphragm valves; the fan air conditioner and ceiling station operating with automatic control showing the sprays intermittently turned on and off as the conditions of the surrounding atmosphere dictate. The Cramer system is used extensively throughout the trade, and as the advantages of conditioning are becoming more recognized by manufacturers, adaptations of this Cramer system are made to accomplish the definite results desired by manufacturers. The automatic humidity and temperature control facilitates atttaining these results. Mr. Cramer was in New York on Monday and Tuesday presiding over the meetings of the American Cotton Manufacturers Association, and like most of those in attendance at that convention, came over to Boston for the National meeting and to attend the exhibition.

William Sellers & Company

The Klauder-Weldon Dyeing Machine Company, Amsterdam, N. Y., exhibited three machines at the exposition. One was a 500 to 800-pound capacity improved raw stock machine made by the company, but the reel is submerged when the machine is in operation, and it is specially adapted for avoiding all rolling or felting of the stock, as well as dyeing it perfectly. They showed also a 28-stick all bronze combination cotton and worsted skein dyeing machine. This has improvements in many and important details. A pair of 21-stick combination cotton and worsted bronze spiders, mounted on a shaft which showed the new skein dyeing machine, particularly adapted to resist acid dyes, completed the exhibit. This machine practically does away with all springs, and is so constructed that the working parts are placed where the danger of the yarn getting

The Klauder Weldon Dyeing Machine Company



Stuart W. Cramer

caught in them is avoided. Its construction throughout is heavier than is customary, and the parts are also larger. It was a prominent exhibit and attracted much attention. Henry Higgs, vice-president, expressed himself as much pleased with the exhibition. Gen. Mgr. Sackett Duell came over from Amsterdam for several days.

The S.K.F. Ball Bearing Co., 50 Church St., New York City, exhibited in addition to a complete assortment of the various types of ball bearings manufactured; a complete shoddy picker equipped with the S.K.F. ball bearings on the cylinder shaft, as manufactured by the Curtis & Marble Machine Co.; a twister frame, a complete section of fifty or sixty spindles in operation, lent by Fales & Jenks; a Garnett breast of the main cylinder of a garnett machine with three fancy rolls completely equipped with S.K.F. ball bearings, lent by the James Hunter Machine Co.; a stock and yarn dryer fan showing the fan shaft and ball bearings, by C. G. Sargents' Sons Corp.; ball bearing spindles from the Whitin Machine Works, and different styles from the Fales & Jenks Machine Co.; napper worker rolls made by the Woonsocket Napping Machine Co., by Davis & Furber Machine Co.; doffer comb box, showing a complete box with five S.K.F. ball bearings in operation, made by the Hubbard Machine Co. All of the above machines were typical of the standard practice by these machine manufacturing companies, and they were all equipped with S.K.F. ball bearings. All through the exhibition were noticed the neat metal signs, "S.K.F. Ball Bearings used on this machine," so that besides their own space there were many other practical demonstrations. Elliott Allen was in charge, assisted by several representatives. Mr. Farr of the New York office was present for a few days.

S K F Ball Bearing Company

A comprehensive display of the machines handled by the Grosser Knitting Machine Company of New York filled their space in Mechanics Building. The working exhibits were limited to a few lines particularly deserving the attention of New England textile manufacturers, and consisted mainly of a set of up-to-date power machines producing Shaker coats in the most practical and economical way. There was also displayed a fully automatic double-lock power machine for turning out rib garments, as fast, it was stated, as they can be made by a circular

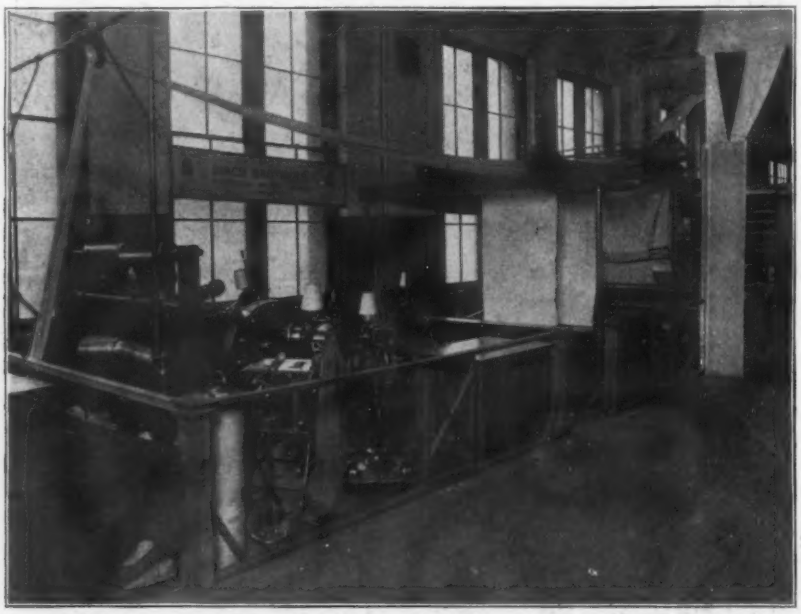
machine, but making them in any desired size, all worsted or with plaited or cotton back. It was most interesting to see the accurate changing of mechanical motions required to produce the various stitches and rack designs. The well known looper handled by this concern was also exhibited. Comprehensive samples, photographs, etc., were supplied to those interested. Max Nydegger with assistants was present during the week and expressed himself as well pleased with the result of his first exhibit in Boston. Several of the machines shown were sold.

The Grosser Knitting Machine Company

A. W. Buhlmann

A. W. Buhlmann, New York (textile engineer) showed several interesting lines, including a napping and fleecing machine for sweaters and fancy knit goods, in opera-

tion; a display of yarn in skeins and on cones, mercerized by Pickup & Kean of Allentown, Pa., on Mr. Buhlmann's mercerizing machine; hosiery from the Holeproof Hosiery Co., for which firm Mr. Buhlmann installed a mercerizing plant; a display of North State flannels made by James N. Williamson & Sons Co., of Burlington, N. C., and napped on the Mueller napping machine, also blankets and other samples napped on this machine, and various clips used on different tentering frames. Mr. Buhlmann and several members of his staff were in attendance during the week.

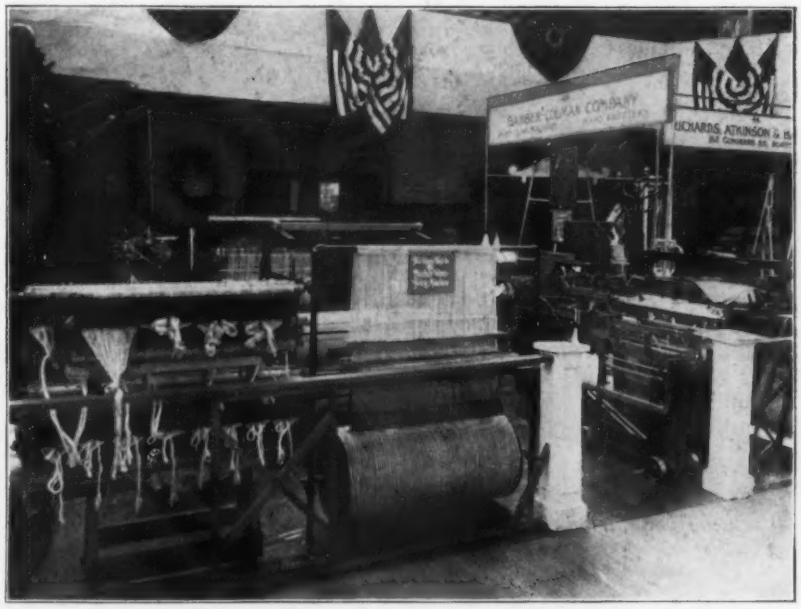


Birch Bros., Somerville, Mass.

Birch Bros., Somerville, Mass., exhibited one of their new starch mangles which consisted of two heavy cast iron frames fitted with compound levers, hand wheels, oscillating nuts and screws, used for raising the upper roll and for putting on pressure. They also showed a patented single roller scutcher for detaining the twists and opening the cloth. Set in front of the starch mangle was a patent angular guide. This machine guides the cloth to the mangle after it leaves the scutcher. They also showed a pair of adjustable spiral opening rollers. The cloth passes through these rollers after leaving the angular guide, keeping out the creases and double selvages. Also included in the exhibit was a solid brass spiral roller, a patented conical expander, a circular sewing machine, two improved "Coronation" sewing machines, one set on an improved American style stand and the other on an English style stand, an "Excel" sewing machine, a tacking machine for making extra long stitches, a cloth examining or perching machine. This exhibit was an elaborate one and attracted much attention. Albert Birch and assistants were in attendance and his sons, Harold, Clifford and Stanley, future partners in the business, were present several days.

The Barber-Colman Company, of Rockford, Ill., exhibited their Barber warp tying machines and Barber knotters, with several important attachments for the warp tying machines which they feature this year. The company state that these attachments enable them to tie in warps of a more intricate nature than they have ever been able to

handle before. They are said to be particularly well adapted to the handling of stripes, and the company expect to be able to interest particularly the mills which are manufacturing a line of striped goods. The Barber-Colman Company also showed their Model K warp-tying machine, which is of the perambulator type. This machine can be moved about the weave room from loom to loom,



The Barber-Colman Company

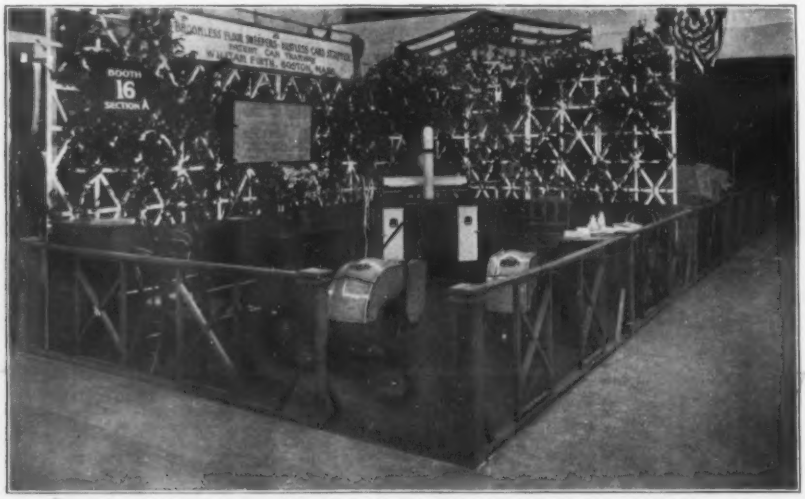
and ties plain, dobby or Jacquard work with equal accuracy. All these machines were demonstrated in operation upon the classes of work mentioned. Mr. McCausland from the home office, Mr. Goodrich of the Boston office were among the staff present.

Attention was readily directed to the booth of the Clark Thread Co., Newark, N. J., by a spool of Clark's O.N.T. set up high from the floor and exactly thirty-seven times the size of the most popular number—No. 50. This company, manufacturers of the famous Clark's O.N.T. six cord 200 yards spool cotton, exhibited in operation a four-spindle automatic spooling machine. It wound a 200 yard spool in forty-five seconds, nicking the edge, pulling the thread through, cutting it, releasing the spool and then automatically starting winding another. The product was ticketed and distributed as souvenirs. Besides the spooling machine there was also shown goods in various processes of manufacture, from the raw material to the finished article, as well as a display of the various O.N.T. products consisting of spool cotton, crochet, knitting, darning and mercerized embroidery cottons, the ever increasing use of which is a tribute to their exceptional quality and merit. There was also exhibited a number of articles worked with O.N.T. crochet and embroidery cottons.

William Firth, 200 Devonshire St., Boston, Mass., exhibited their dustless card stripping apparatus, patent can tramway and broomless floor sweepers. This last is something entirely new and on account of their simplicity and great value to the mills proved especially attractive to all progressive mill men. These floor sweepers are in use in cotton, worsted and silk mills. They remove lint and waste from under and around spinning frames and other machinery. These broomless floor sweepers go in pairs. No.

1 gently forces lint and waste from under the machinery into the opposite alley. No. 2 picks up the lint and waste free from the

Thomas Leyland & Co., 60 India St., Boston, Mass., had a large and well located space for their display of Mycock's machines



William Firth's Exhibit

usual matting and broom straws, leaving it easier to sort. Jos. J. Smith was in charge

and other specialties for dyers, bleachers and finishers, covering many of the most

Thomas Leyland & Company

with several assistants who were kept busy giving demonstrations of this useful new appliance.

important classes of work. Among the machines shown were: a 46-inch 3-bar calender expander; two rollers with frame and batch

bars, etc.; a 72-inch 3-bar calender expander with center supports; a 48-inch double beat single roller scutcher; a high lift sewing machine; an ordinary mill sewing machine; and a whaleback sewing machine with new stripping attachment. The exhibit was a prominent and instructive one. Col. F. T. Walsh, manager of the company, with several assistants, was present during the week.

The Steel Heddle Mfg. Co., 2110-18 West Allegheny Ave., Philadelphia, Pa., exhibited the Simplex drawing-in machine described in full in another part of this issue. There were quite a number of looms running in different parts of the hall equipped with harnesses manufactured by this company. In addition they also displayed samples of their various makes of heddles and frames, enabling them to give a practical demonstration of everything they manufacture. Robert J. Freitag, the secretary of the company from

The Steel Heddle Mfg. Co.

Philadelphia, and Mr. Hill, New England representative, were in attendance.

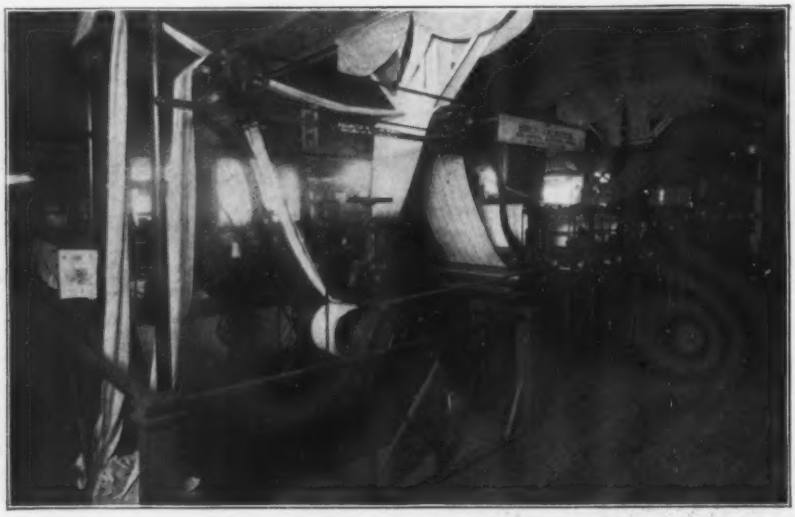
The Franklin Process Co., 291 Promenade St., Providence, R. I., had a very interesting exhibit consisting of a complete line of dyed samples including yarn on their Franklin patented tubes, a diversified collection of the woven goods and two model dyeing machines, enabling them to show to the trade not only samples of their custom work, but also the practical workings of the machines which they install. These machines are built in numerous sizes and furnished with a capacity of from 25 to 1,000 pounds to a batch. They make a specialty of supplying a complete dyeing equipment to the textile

The Franklin Process Company

trade. This company receives the yarn from their many customers on spinning frame bobbins, dyes it and returns it to them on their Universal wound Franklin patented tubes ready for the creel. This exhibit created a great deal of interest and was under the general management of J. B. Barrett, agent.

Smith, Drum & Company, of Philadelphia, the well known manufacturers of machinery for dyeing and finishing hosiery, underwear, yarns and piece goods, who have exhibited largely at Philadelphia textile shows, took part this year for the first time in the Boston show, although they had no machines on exhibition. They displayed a number of large photographs, showing the details of their latest type of mercerizing machines for warps as well as skeins, and giving a clear idea of their arrangement and use.

The Arlington Machine Works, Arlington Heights, Mass., showed several of their most important textile finishing machines. Their improved cloth opener or scutcher was exhibited opening out the cloth as it would naturally come from the squeezer or hydro-extractor. This machine opens out the "twist" and leaves the cloth smooth. After it leaves the cloth opener, the fabric passes through their newly improved adjustable tension bars, thence through angular guide rollers which smooth out all wrinkles and creases, ready for the open soaper, before which the angular guide rollers are placed. This open soaper was their most improved type. The soaper is a five-compartment machine. The standard length of machine is eight-compartment, although any length can be furnished, from three to eight compartments, to suit the capacity of a mill. After the cloth has left the open soaper, it is taken over a reel, from which it is picked up by the Arlington standard squeezer, and carried back to the cloth opener or scutcher. The company also showed their patent bell crank adjustable cloth stretcher or expander, which is used before water mangles and drying cylinders for stretching the cloth. Other machines displayed were the Arlington improved sewing machines and the Arlington improved patent sectional scrimp rails.

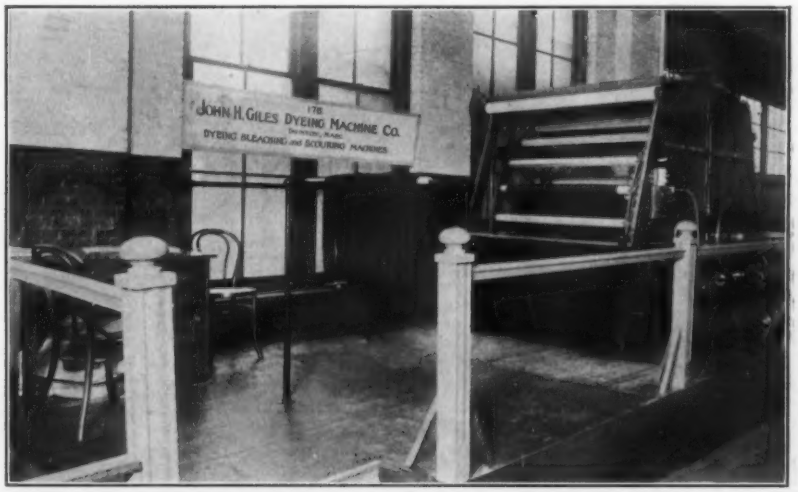


Arlington Machine Works

Alfred Suter, 200 Fifth Ave., New York, exhibited the latest types of testing apparatus and other new machinery, including a new type conditioning oven with electric heating appliance and pre-drying arrangement and a new twist tester with magnifying glass for getting at the spinning twist. An arrangement was provided which gave to all threads being tested the same tension in order to secure accurate tests. Yarn scales, roving scales, reels and the automatic strength and elasticity testers for yarns and cloth, a new pick counter with three lenses magnifying 6.20 and 41 times, a new reed cleaning and polishing machine was shown. Many visitors availed themselves of the opportunity of testing yarn. The ring traveler setter, for which Mr. Suter is agent, attracted much attention from spinners. There was a full set of catalogues of all the other machines which Mr. Suter imports on hand. Besides Mr. Suter, Gordon M. Stanton and Fred Mostertz was in attendance.

Messrs. Jolly & Willis showed an operating exhibit of their detaching motion for the Heilman comber in the basement.

Spaces 176 and 177 were occupied by the John H. Giles Dyeing Machine Company, of Taunton, Mass., and Amsterdam, N. Y., in exhibiting their new skein dyeing machine, which we recently illustrated and described in the New Machinery Department of the Textile World Record. The machine was shown in full working order, and created much interest. They had catalogues and circulars describing the machine in detail. John H. Giles, president of the company, and Donald M. Giles were in attendance, and were kept busy explaining the merits of their machine to their many callers, who represented many of the leading mill men of the country. They also exhibited the

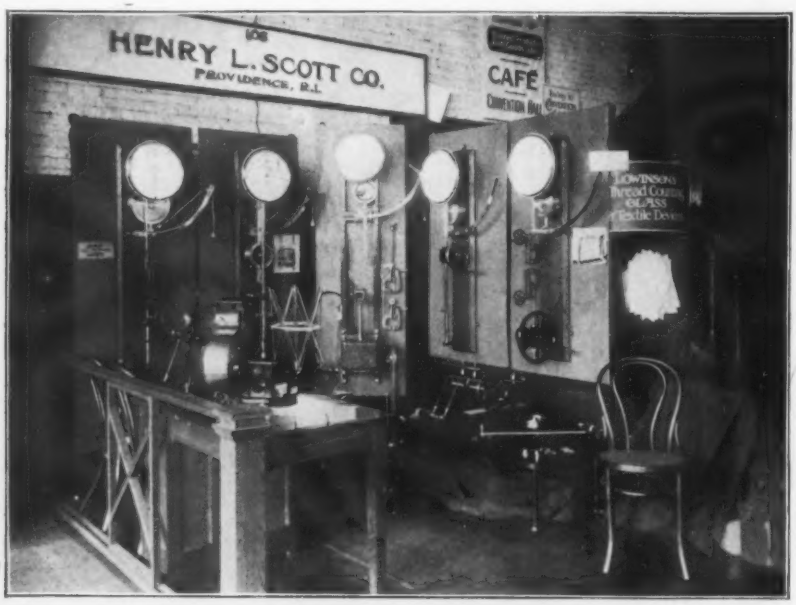


John H. Giles Dyeing Machine Company

Alfred Suter's Exhibit

new Sarco regulator, with which they guarantee to keep the dye bath constantly at a boil without attention.

tester described at some length in another part of this issue. They had a very attractive and well located space as the picture



Henry L. Scott & Company

Henry L. Scott & Co., Providence, R. I., exhibited their yarn and cloth testers. In

will show. Both members of the firm were present.

Union Special Machine Company

addition to these machines they showed their regular line of reels, scales, twist counters, etc., and a new combination yarn and cloth

The Union Special Machine Company, 96 South St., Boston, exhibited the following machines: Their cup feed machine with the

overhead outside cup drive which makes an overcast stitch and is intended for seaming selvedge edge work such as sweaters, full fashioned knit garments, hosiery, etc. A Fig. 8 stitch machine 2 needle zig-zag for ornamental open work stitching such as tubular work on ladies' vests. A side wheel cylinder single needle machine with horizontal trimmer for single operations flat seam, also for shaping ladies' vests. A two needle 4-thread machine, both sides being an overcast stitch for sewing single headed lace to underwear. A vertical knife trimmer with differential feed for seaming heavy sweaters and like material. A Dewees trimmer with differential feed and other improvements, for seaming purposes. An

The Sharp Mfg. Co.

over-edge 3-thread edge stitching machine with third thread control, whereby a uniform elastic square edge is obtained. A 2-needle diagonal stitch machine for ornamental stitching, also for attaining superposed parts of garments and covering raw edges simultaneously. There were also displayed various well known single and multiple needle flat bed cylinder machines for the different operations in the manufacture of knit goods and hosiery.

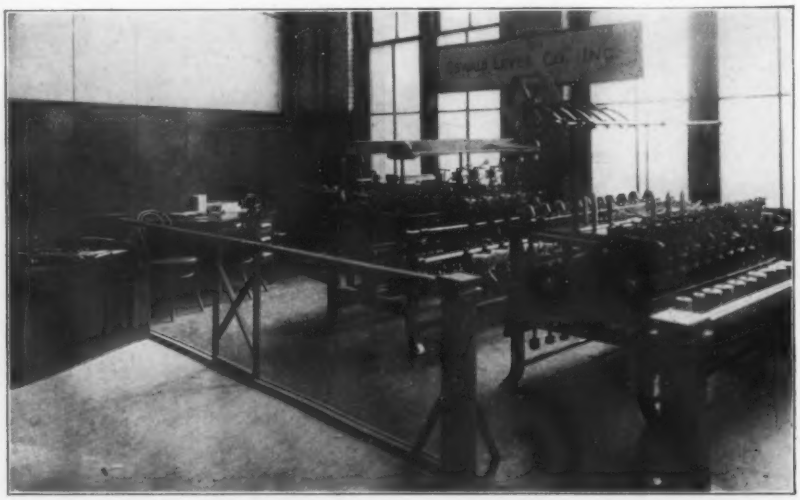
The Sharpe Mfg. Co. of New Bedford had an attractive booth which had for a background the trade mark of the company in different colored incandescent lights. A large show case contained many samples of their Sea Island cotton yarns in skeins dyed in different colors, while on a table were samples of this company's yarns on cones and cops.

Emerson Apparatus Company

The exhibit of the Emerson Apparatus Company, Boston, consisted of a four basket textile conditioning oven, a new smaller textile conditioning oven (equipped to test one sample at a time) and the Emerson fuel calorimeter for determining the heat value of fuels. The large oven is designed for determining the moisture content of relatively large samples of textile materials, such as yarns, worsted tops, cloth, wool, jute, etc. It is a complete testing unit, consisting of a drying oven with accurate weighing balances, mounted adjacently, permitting of weighing the sample while in the oven. It is electrically heated and the temperature regulated with thermostat. Forced circulation of heated air is maintained through the oven by means of a small motor-driven fan. The

small oven is arranged to operate in similar manner to the larger oven, except that the temperature control is maintained by an adjustable rheostat in place of the automatic thermostat regulation, and its interior dimensions permit of only one sample-holding basket. The Emerson fuel calorimeter determines the value of coal in terms of the heat units it contains, and enables the purchaser to buy his coal at so many heat units per dollar.

The Ainslie Knitting Machine Co., Brooklyn, N. Y., showed the following: A single bed shaker machine, three needles to the inch, sixty-four inches wide (3 by 64 inch), with power attachment, chain drive, with special apparatus shortening chain, and automatic change of yarn guides, which will make a complete body with a welt at the bottom, and arm-holes made automatically; a single lock full automatic machine, five gauge, thirty-four inches wide, (5 by 34 inch), needle beds on both sides of the machine, built on the company's back drive attachment, short chain system; a ten gauge machine, twenty-four inches wide (10 by 24 inch), short carriage, high bridge, with the same attachment as above on the five gauge machine, and with a special apparatus for making tubular and flat underwear in single and combination garments; a double lock full automatic machine, seven gauge, thirty-six inches wide (7 by 36 inch), with German wide chains using the short chain principle, and made so that the goods knitted are protected from oil-spots while the machine is in operation.



The Oswald Lever Company

The Oswald Lever Co., Inc., Philadelphia, Pa., builders of textile machinery for the silk and general textile trade, showed two models of their machines, one a winder made by them for the purpose of winding from skeins, spools or any kind of spinning bobbins for automatic or any kind of shuttle bobbins or paper tubes; the other a winder suitable for all kinds of cops or quills up to three inches in diameter. The operations of these machines created a considerable amount of attention, due to the novel manner in which they were constructed. Daniel Joyce, one of the members of the company, gave the matter of demonstrating the machines his personal attention, and at all times during the exhibition was the center of a considerable number of investigators informing them as to the value of the machines for use in their plants.

Messrs. Schwartz and McIntosh, of L. H. A. Schwartz & Co., were visitors at the show almost every day.

Curtis & Marble Machine Company, Worcester, Mass., exhibit consisted mainly of a single cutter list saving woolen shearing machine, motor driven. This machine is equipped with an automatic seam-lifting device by which a roll lifts the cutting parts away from the rest automatically, and a device working in connection with this same seam after it has passed the cutting parts drops them back into position after any determined amount of cloth has passed the rest. The lifting device can be set for any class of goods so that practically more than one thickness of fabric, like a crease or fold, passing under the lifting device will throw cutting parts out of action. It is almost impossible for the operator to run his fingers into the cutting parts. This seam lifting device can be applied to standard makes of shearing machines. Besides the shearing machine they had twin screw rolls and spreader rolls; measuring dials, both single and double; winding bars to be used with paper tubes; and collapsible plates for winding cotton or woolen goods. In the S.K.F. exhibit they had one of their shoddy pickers equipped with that make of ball bearings. This was being driven by a narrow cotton band, which showed the little power that is required to run the machine when so equipped. E. H. Marble, the president, was in charge of the exhibit, and the other members of the company, W. C., C. F. and A. C. Marble were in attendance.

The Hinsdill Electric Co., Troy, N. Y., showed a table fitted up with their adjustable fixtures arranged for attaching to the under side of thread or running board. This Hinsdill arm is adaptable to any machine and its light may be concentrated on any local point.

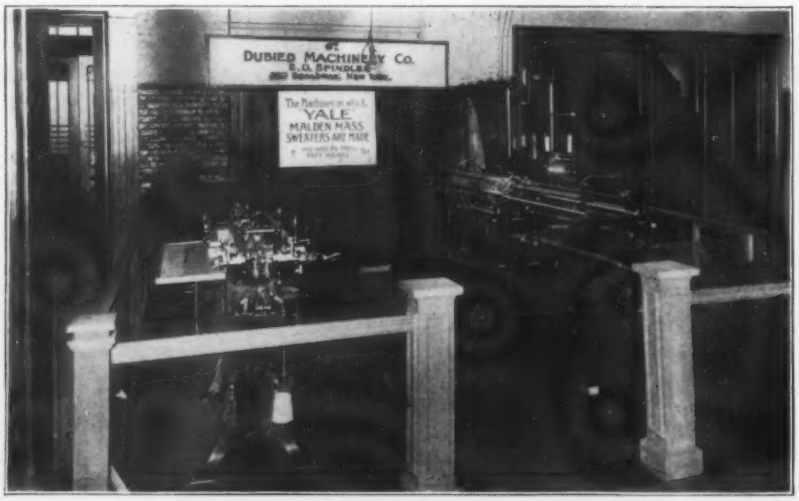
The Curtis & Marble Machine Company

The Connecticut Mill Supply Co., of Torrington, Conn., exhibited their "Connecticut" spinning rings, of which they showed a full line of samples. They also had a display of their drop wires.

E. O. Spindler, New York, exhibited two flat knitting machines, built by Edward Dubied & Co., Couvet, Switzerland. The machines embody the latest improvements and many features of interest to those engaged in the knit goods business. One shown was a Dubied links and links (pearl stitch) machine, for the production of "basket stitch," etc., on ladies' sweaters, infants' leggings, jackets, etc. The other was a full automatic power knitting machine for the production of shaker and "jumbo stitch"

sweater coats. It is a combination machine for both stitches, having a large production,

An exhibit of unusual interest was made by the Morse Chain Co., of Ithaca, N. Y. A



E O. Spindler's Exhibit

and a great variety of purposes for which it can be utilized. This machine was of special

large illuminated glass sign in the rear of the booth attracted visitors and called their at-

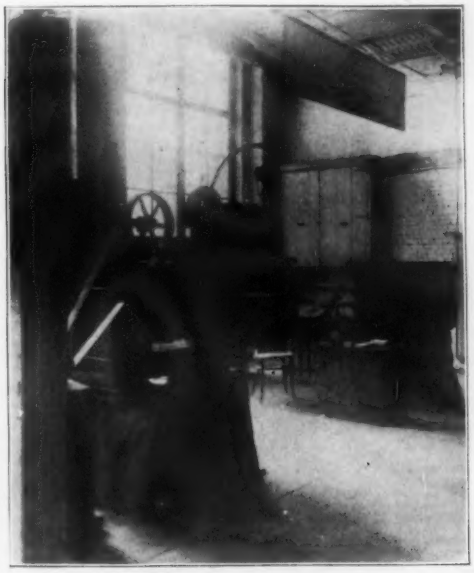
The Morse Chain Company

interest to New England manufacturers, as many goods that may be produced by it are made in the New England States.

tention to the efficiency of Morse transmission for machinery of all kinds. They also had in operation a special machine upon

which was mounted a large chain drive of 100 h. p. capacity and also a small drive of 2 h. p. capacity. This machine was fitted up with a very ingenious device, a small black disc revolving in an opposite direction to the chain and containing two slots for the purpose of enabling the observer to see the "rocker" motion of the chain while in operation, a feature which the demonstrator was particular to impress upon the observer as of great importance. J. S. White, New England manager, was in charge.

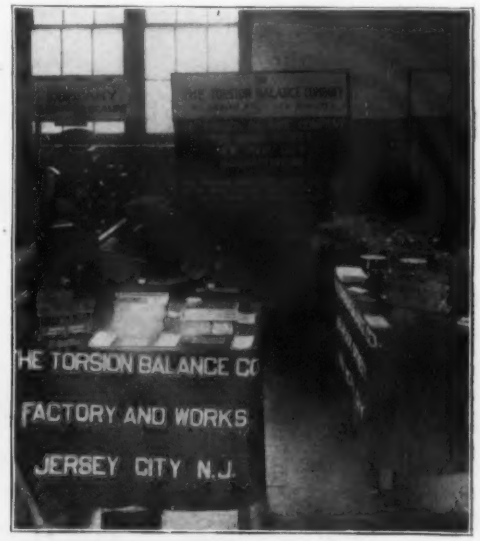
The Hussong Dyeing Machine Co., Groveville, N. J., exhibited in operation a miniature model of their skein dyeing machine, so constructed that the course of the



The Hussong Dyeing Machine Company

liquor as it permeates the stock can be seen and studied and the thoroughness of the Hussong method of impregnation understood. Their exhibit proved a revelation to many. Their miniature machine proved the advantage of complete immersion of the stock throughout the treatment and the gentle, positive and constant flow through the dormant mass. They also showed a miniature model of their hosiery dyeing machine constructed of transparent material so that the interior parts were within plain view. This machine was not connected up with power, but was otherwise complete in itself. J. Harry Thompson, general manager, came on from Groveville and A. R. Heritage, Eastern representative was also present.

Morris & Company, Groveville, N. J., exhibited samples of their duck mill baskets so well known to textile mills in all parts of the country.



The Torsion Balance Company

Torsion Balance Co. had a varied exhibit of their scales and balances. The one which attracted a great deal of attention was the self computing textile scale. This scale gives the ounces per yard of goods of any width woolen and worsted, sample used being four square inches. They also showed a cotton balance which gives the self computed number of yards per pound from a nine square inch sample of any width. Among the other scales shown in an attractive and interesting way were the cotton yarn numbering scale, woolen and worsted yarn numbering scale, and a hosiery scale, and many dyers, and chemical balances. The booth was in charge of Mr. Hayes and Mr. Symington.

The Roessler & Hasslacher Chemical Co., New York, demonstrated their improved methods of bleaching, also showing mill samples from present users of their peroxide bleach. This company was represented by a number of their bleaching experts who were ready to discuss any bleaching proposition presented to them, and make appointments for mill demonstrations. Their exhibits are always tastefully arranged and this was no exception.

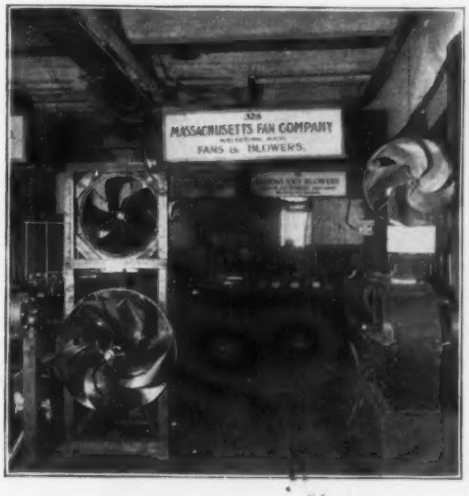
The Borne, Scrymser Company

The Roessler & Hasslacher Chemical Company

The Borne, Scrymser Company, 36 Central Wharf, Boston, had an interesting and instructive exhibit of their textile oils, which

included Breton oils for wools, apron oils, shear oil, paragon loom or knitting oils, and spindle oils, as well as a full line of their well known lubricating oils. They showed great pride in their record of over thirty years with the Breton oils for wool and exhibited goods in differnt states of finish or process, as shoddy, yarns and finished goods in white and colors, demonstrating the excellent results and unexcelled grade of products that are attained with their oils. James E. Kimball, superintendent of sales from New York, and F. W. Bradley, manager of Boston office, were present during the week.

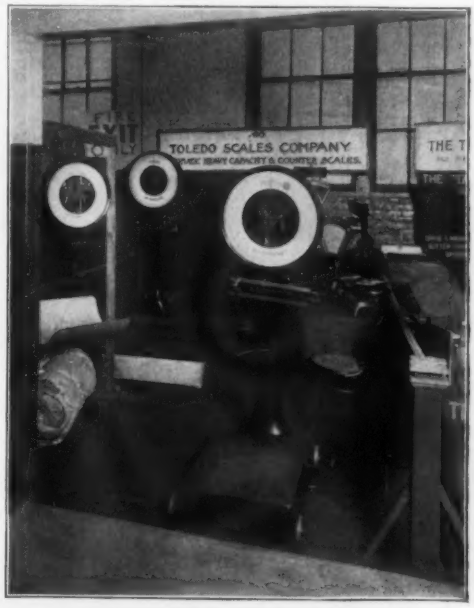
The Massachusetts Fan Co., Watertown, Mass., showed in their exhibit, for the first time, one of five fans just produced by them and especially adapted for dye houses and bleacheries. This fan is made of what they call Monel Metal, which is a resistant against acids and gasses. The fan exhibited



The Massachusetts Fan Company

was submerged in commercial acetic acid for 28 days and in that period, according to their test card, lost only .9 per cent., while copper lost 1.35 per cent. and bronze 3 per cent. In addition to this fan they showed their various lines of ventilating fans used for exhausting air in mills, dye houses and bleacheries, one of which they had in operation delivering 4,000 feet of air on a 3/10 h. p. motor drive.

The Toledo Scales Co., Toledo, O., had a large variety of automatic gravity scales on exhibition. Heavy capacity both portable and dormant. They have just brought out a new hanging springless dial scale especially designed to weigh cotton laps on; also a

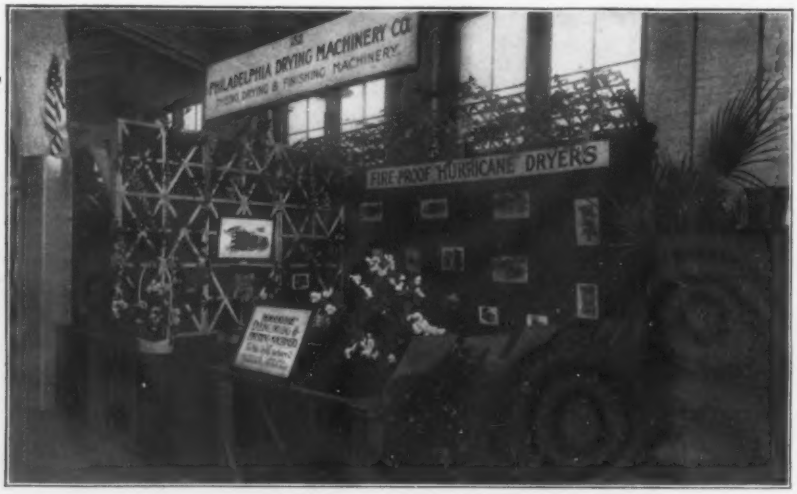


Toledo Scales Company

bench scale of 115 lbs. capacity for weighing cloth in the web. The U. S. Government is using 700 Toledo scales in their largest offices, one of which was shown at the exhibition. Mr. Hapgood and Mr. Moulton were in charge of the exhibit.

The Philadelphia Drying Machinery Co. was one of those who exhibited for the first time at the exhibition in Boston. Their machinery requires so much room that, in view of their large space at the Philadelphia Exhibition a week later where their machines are shown in operation, they used their space for illustrating by large photographs the latest ideas in dyeing, drying, singeing and finishing machinery. Pictures were shown of their fire-proof Hurricane dryers built entirely of steel and insulated with air cell asbestos; circulating dyeing machines by which the flow of the dye liquor is

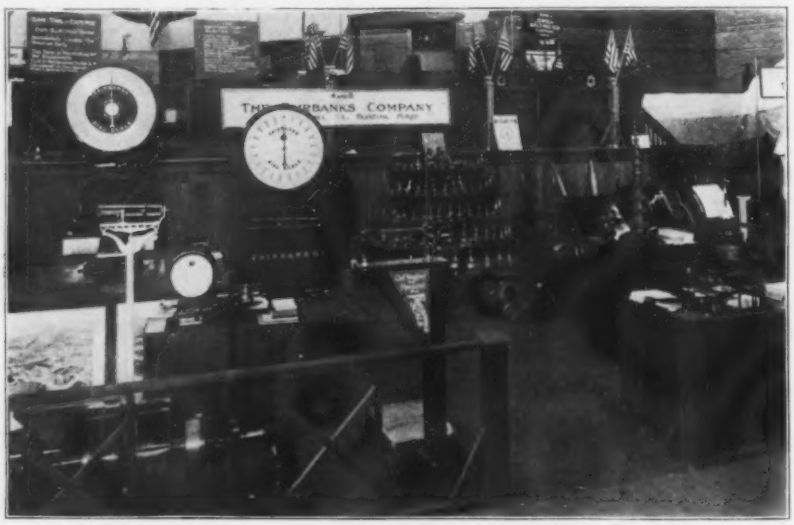
controlled in either direction automatically so as to secure uniform results in dyeing various sizes, the control being entirely automatic and making it possible to deliver the



The Philadelphia Drying Machine Company

hydraulic and power screw presses, were illustrated. A number of improvements were pointed out in the automatic hosiery singeing machine. An automatic machine for drying and conditioning skein yarn was

yarn from the machine with a moisture content of any percentage desired. A number of these machines have been installed with most excellent results. Photographs of heating and ventilating apparatus built by



The Fairbanks Company

this company as well as other installations give a good idea of the completeness of its lines. W. W. Sibson, treasurer, came on for several days and Mr. Smith of the Boston office was present during the week.

It is hardly possible to give in such short space a description of the line of goods exhibited by probably the largest mill supply house in the world, such as the Fairbanks Co., with branches all over the country. This concern through their Boston office exhibited several specialties of interest to the textile trade such as the R. & S. dial scale with a capacity of 5,000 pounds, a springless and rackless scale and The Fairbanks dial scale, in addition to their regular line of scales suitable for textile mills; valves of all sizes and dimensions, trucks and transmission supplies, the exhibit being under the supervision of C. E. Thyng.

Howard Bros. Mfg. Co., Worcester, Mass., exhibited two card-setting machines in operation, manufacturing main cylinders and doffers for revolving top cards. These machines are of the latest design, specially constructed for accuracy in setting and equipped with the latest and most efficient automatic stop motions. The company also showed a small model of a woolen card in actual operation, carding wool stock, and a large model of the Midgley improved style No. 3 stripping card, of which they are the sole manufacturers. They have made card clothing for cotton, woolen and worsted cards for over forty-four years, and are also extensive manufacturers of the improved German twin wire heddle.

The American Warp-Drawing Machine Co., Boston, Mass., exhibited its well known full automatic drawing-in machine, covering cotton harness, reed and drop wires, and its Axminster tubing machinery and equipment, used in many carpet mills. The company also showed three entirely new devices. These were a semi-automatic warp drawing machine for steel or wire harness, up to 24 shaft, with any number of beams or colors; an automatic lease picking machine for picking lease in a warp that has been beamed, and a lease striking attachment for striking a lease in each warp as it is run off the slasher.

Howard Bros. Mfg. Co.

The Leatheroid Manufacturing Co., Boston, exclusive manufacturers of Leatheroid sample trunks, roving cans, insulating material, etc., showed an extensive line of their specialties.

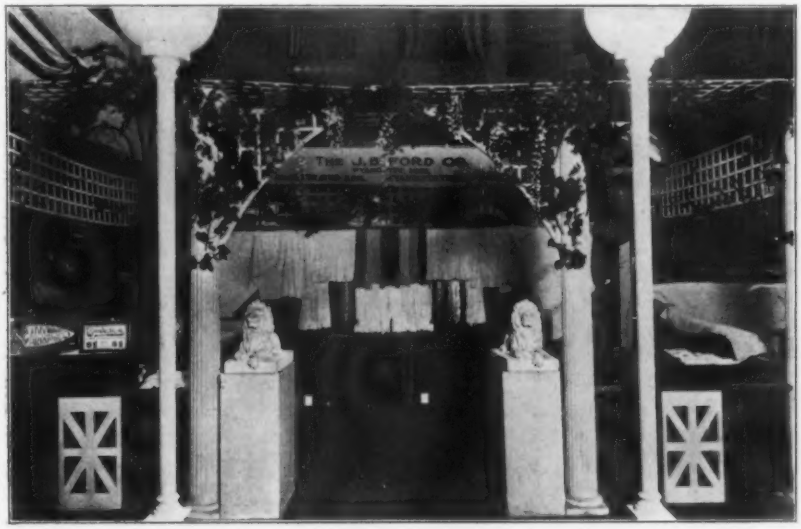
The U. S. Gutta Percha Paint Co., Providence, R. I., displayed and demonstrated the wonderful light reflecting and light giving properties of Rice's gloss mill white. The ceiling of the booth was finished with Rice's mill white, reflecting the light just as does a mill ceiling to which the same paint has been applied. This tile-like surface means increased sanitary conditions, not only because of the added light, but for the reason that the surface affords no lodgment for germs or dirt to accumulate. In their exhibit was included photographs of scores of textile mills painted throughout with Rice's mill white and testimonials from prominent mill men. Herbert W. Rice, president; Chas. W. Eastwood, secretary; Alex. S. West, general sales agent and Geo. J. Kilton, superintendent were in attendance.

U. S. Gutta Percha Paint Company

Everybody in the textile trade knows "Wyandotte." This year, as usual, the exhibit of the J. B. Ford Co. was an elaborate one, with Mr. Klebart in charge, meeting not only his old customers but many new ones. The exhibit consisted of silk, cotton, woolen, worsted, and in fact samples of fab-

rics and yarns made from all classes of fibers treated by the well known Wyandotte processes.

The Cell Drier Machine Co., Taunton, plants for handling white goods, its special advantage being the high speed at which it can be operated and also the small amount of floor space required.



The J. B. Ford Company

Cell Drier Machine Company

Mass., showed a small drier illustrating their well known unit principle of construction and their improved roller chain drive. This machine is used by bleacheries and finishing

The Dodge Manufacturing Company, 137-139 Purchase St., Boston, Mass., exhibited a complete line of power transmission material consisting of hangers, shafting, pulleys,

couplings, friction clutches, etc. The Dodge iron center wood rim pulley attracted particular attention, it being built for extreme hard work and high speed. This style of pulley is ideal for textile mills and has been built to run five and one-half miles per minute, a speed at which no other pulley made has ever been known to run.

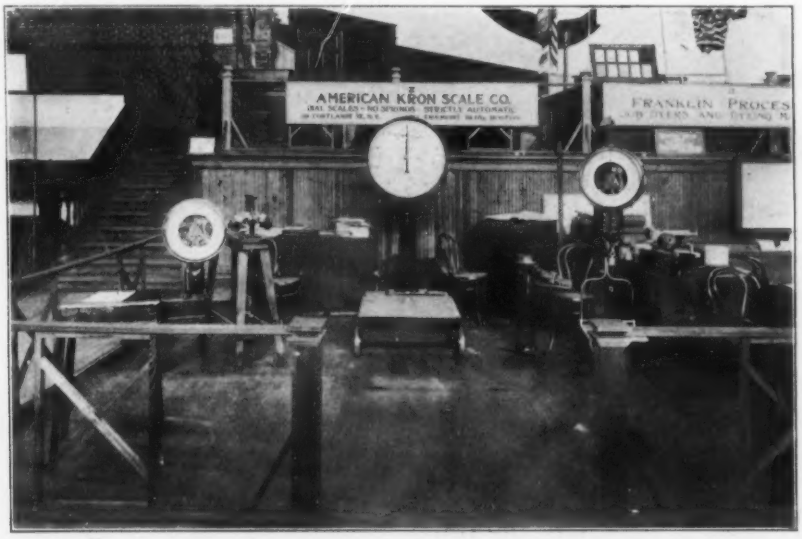
The New York Revolving Portable Elevator Company, of Jersey City, showed the very latest improvements in the revolvator, the "New Model 'F'." These improvements include the up-to-date floor lock, the new safety raising and lowering device and several other features never before shown. The motor driven revolvator was also exhibited

The Dodge Manufacturing Company

The New York Revolving Portable Elevator Company

and the company had efficiency men in attendance during exhibition hours, who demonstrated the revolvators in actual operation to a large number of mill managers.

The American Kron Scale Co. exhibited some of the many types of scales which they manufacture. The Kron scale automatically and accurately registers the weight of any object placed on the platform. There is no occasion for adjusting weights or balances and no auxiliary beams to take up excess weight over capacity of dial. All that is necessary is to "Load and Look." A most important advantage of this scale is the fact that it is operated, and controlled wholly without the aid of any springs, nor has it any knife edged pivots in the dial mechanism, thus insuring absolute accuracy not only when the scales are first put into use after accurate adjustment, but at any and all times so long as the scales remain in use. An inspection of an exposed dial mechanism shows the frictionless bearings of hardened steel. The exhibition was in charge of Mr. Fitzgerald, the Boston manager, with a corps of assistants.



The American Kron Scale Company

B. F. Roy & Son of Worcester, Mass., manufacturers of the napper roll and card grinding machines, also calender roll grinders, showed these machines in motion at their booth in the basement. C. H. Philbrick was in charge.

The Davis & Furber Machine Co., North Andover, Mass., exhibited their new 36-roll double acting ball bearing napper for all kinds of cotton goods and blankets with a percentage of cotton. This company were among the first in the country to take up the manufacture of napping machinery and their new machine proved of special interest to manufacturers.

Mr. Seydel, of the Seydel Mfg. Co., Jersey City, N. J., manufacturers of sizings, was in attendance at the exhibition for several days in the earlier part of the week. Several of the looms in operation were using warps sized with "Sizol."

The American Tool & Machine Co. of Boston exhibited at their space a full line of Weston hydro-extractors which they make in sizes 20-26-36-42 and 54 inches diameter, also a line of Centrifugal oil separators. They had a small machine in operation dry-

ing out cones for the Franklin Process Co. after they had been dyed. They also had a full line of power transmission equipment and American steel pulleys. Edw. J. Eichler was in charge of the exhibit and was assisted by Mr. Vialle of the American Steel Pulley force.

The Holster-Cabot Electric Co., Brookline, Mass., exhibited a line of their electrical devices and specialties. What attracted most attention was the electrically operated signal horn designed to attract attention of superintendent or officials in large plants who may be wanted in the office. Horns similar to automobile horns are placed in various rooms and a call sounded from the office. Practical demonstration was given in the exhibition building.

The Cooleemee Quill Cleaner, a machine for the purpose of cleaning automatic loom bobbins, was shown in operation by a company of the same name in Charlotte, N. C.

Although Speed & Stephenson, worsted machinery importers and dealers, did not have regular space, the worsted comb operated by the Worcester Textile School, built by James Smith & Co., of Worcester, is a machine for which they are agents and one of the members of the firm made that space headquarters to give information and answer many inquiries about this machine.

The exhibit of the Cling-Surface Company, Buffalo, N. Y., was designed to show the advantages of a belt which had had Cling-Surface treatment and was run slack over a similar untreated belt, even when it was run tight. The display consisted of the installation of a power-driven three-cylinder pump, which forced the water into a standpipe, the pressure being registered by gauges. The pump was driven alternately by two belts, one of which had had Cling-Surface treatment, while the other was untreated. The treated belt was run slack, and its efficiency over the untreated belt became at once clearly apparent by the gauge reading. The belts were so arranged that the initial tension could be varied on either belt.

The American Tool and Machine Company

The Psarski Dyeing Machine Company, Cleveland, O., exhibited one of their small bronze dyeing machines. The machine shown was an exact duplicate of many which are in use in textile schools, laboratories and other places where small batches of material

are to be dyed. This machine is identical in construction and principle with the larger machines. This machine was also provided with an overhead hoist and trolley and other accessories which made the exhibit a miniature reproduction of the larger machines as installed for actual operation in dye houses. The interior of the machine was open so that the method and principle of operation was clearly and easily understood by the visitors. Diagrams illustrating the Psarski principles

The Psarski Dyeing Machine Company

was also shown. Among the other interesting things exhibited were samples of various materials which are being dyed daily by users of the Psarski dyeing machine. Mr. Inman, who thoroughly understands the operation of the Psarski machine, was in charge of the exhibition.

Stephen C. Lowe, 178 Devonshire St., Boston, Mass., agent for John Hetherington & Sons, Ltd., Manchester, Eng., exhibited one of Nasmith's latest improved cotton combers, 12 1/2 inch lap with aspirator and waste conveying lattice, 6 heads running 1/16 stock. The advantage of the waste conveying apparatus being that the waste is collected together, drawn through a draw box and put into the form of a sliver of any desired weight and coiled into a can ready to go forward through the drawing and spinners without the necessity of going through the pickers and cards, saving a considerable amount of loss in these processes, the waste being suitable for use in low counts. Mr. Lowe also showed, in operation, a Nasmith camless quick traverse cross winding machine (Taylor's patent) a machine which is absolutely camless, the motion of the traverse motion being rotary with no strain on the yarn. To show this fine hank roving from a roving frame bobbin was wound on the machine. Mr. Lowe and a staff of assistants were in attendance.

David Gessner, Worcester, Mass., manufacturer of the Gessner napper, had on exhibition one of his three string twenty-four roll nappers. Mr. Gessner was at booth in person to answer all inquiries as to his machinery.

Permutit Company. This company had an attractive booth in the basement in charge of Mr. Calvo of the New York office. It consisted of two of their smaller Permutit water softeners as actually installed. They also had demonstrating models in which any water was softened for visitors, which com-

pletely showed the principles of the Permutit process. The walls of the booth were adorned with photos of notable installations, while a table held many blue prints of Permutit Softeners specially designed for textile mills.

The exhibit made by Lewis E. Tracy Co., 490 Atlantic Ave., Boston, Mass., had for its special feature a motor driven No. 3, Class B., Reeves variable speed transmission and wood pulleys, built by the Reeves Pulley Co., Columbus, Ind. The Keystone split steel pulley and the Brown ring oiling clutch and Hyatt roller bearings also came in for favorable comment from the mechanical element present.

The Autoforce Ventilating Co., Boston, used their space to entertain their callers and explain their method of economically ventilating textile mills and controlling humidity and temperature and maintaining a definite displacement throughout textile plant.

The U. S. Bobbin & Shuttle Co. had three large cases displaying their bobbins, spools, jack spools, beams and shuttles at their booth. The many sizes and kinds of manufactured product which this concern produces made an attractive display. J. Henry Thorpe, sales agent for the company was in charge.

The exhibit of the Macrodi Fibre Co., Woonsocket, R. I., in charge of S. T. Packard, the proprietor, occupied space with the Dana S. Courtney Co., of Chicopee, Mass. The display of the Macrodi Fibre Co. consisted of a full line of its fiber-head spools, and that of the Courtney Co. included the various kinds of wooden spools and bobbins which it manufactures.

The Permutit Company

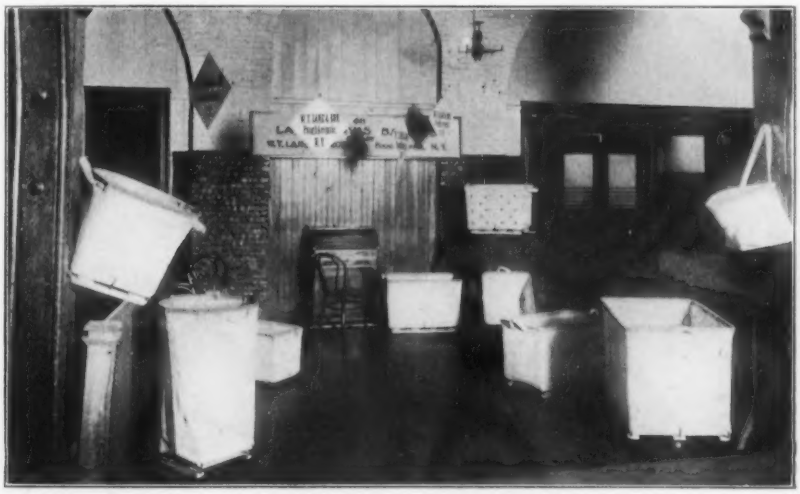
The Veeder Mfg. Co., Hartford, Conn., exhibited counters for all branches of the textile industry, i. e., for looms, spinning machinery, warp beaming machines, etc., also counters to measure feet and yards. They also showed counters for use in bleacheries and mills where an accurate record of the amount of work turned out by each employe is desired. The Veeder counters are straight reading and are dust-proof.

W. T. Lane & Brother, of Poughkeepsie, N. Y., were in the West Hall this year and had a space on one of the side aisles where they had a good opportunity for the display of their general line of canvas mill baskets

and trucks. The exhibit was in charge of A. H. Lane and Mr. Curley. This concern has studied the peculiar requirements of textile manufacturers in all branches of the trade and whenever the need of a particular kind of basket or truck is apparent they meet it with the result that the demand for their specialties keeps them busy all the year round. They make their own duck and turn out a first-class product.

Churchill Hungerford, of Messrs. Hungerford & Terry, of Philadelphia, was a member of the committee on the meeting of the National Cotton Manufacturers Association, and was present during the convention for several days at the Boston Exhibition, coming over from New York where he had been in attendance at the New York meeting.

S. F. Bowser, Inc., Fort Wayne, Ind., with C. C. Fredericks of the Boston office,



W. T. Lane & Bro.

The Emerson Laboratory, Springfield, Mass., showed by means of illustrated cards and chemicals the line of work done in their laboratories which they have equipped for making textile analysis from the raw materials to the finished products such as bleaching, dyeing and printing, weaving and finishing oils, etc.

The attractiveness of the booth occupied by the Carbolineum Wood Preserving Co. was worthy of its success and a number of orders for Carbolineum were listed from some of the largest mills and companies of the cotton industry. Woolen manufacturers also came to gather information, and judging from the orders given for the wood preserver there is evidently a good deal of building and repairing going on. The exhibition was under the direction of Ralph M. Eisenberg, sales manager.

H. M. Bowser, Vice-President, E. H. Briggs, general sales manager, in charge exhibited a general line of their oil filtering, storage and measuring devices. The feature of the exhibit consisted of a working model of a filtering and circulating system showing the oil entering the feed cups, and then running down upon the bearings of an engine, clarifying the oil by bringing it back again to the gravity tank, which supplies the bearings of the engine with clean oil.

The C. J. Root Company, Bristol, Conn., showed a large line of automatic counters and measuring devices for textile purposes. They are selling an increasing number of counters to textile manufacturers for use on looms, cloth folders, tenter frames, rolling machines, singeing machines, calenders, etc. New uses are constantly suggesting themselves and each individual problem re-

ceives careful attention. They make counters to operate by both the reciprocating and rotating motions, and the various types of resetting and non-resetting. Their counters are manufactured to register by the pair, dozen, or gross, yard, half-yard, one-third yard, etc., and they can supply them with bells to ring at different intervals. The company also make a large line of wrought brass hinges and metal stampings, of which they showed a handsome line of samples at the exhibition. J. T. Chidsey, treasurer, was present for several days.

R. & J. Dick, Ltd., New York City, exhibited various sizes and weights of Dickbelt, together with a mechanical display showing the Dickbelt running under water. They also had on exhibition a large roll of belt 550 feet long, designed to show the construction, pliability and general uniformity of the belt.

The Holyoke Machine Co., of Holyoke, Mass., showed their hydraulic governor for water wheels. They also showed in motion the Lombard friction clutch, which is the latest clutch of the rim friction type. The exhibit was in charge of D. White and N. Lombard, the inventor of the Lombard clutch.

Jones & Hardy, Inc., Hudson, N. Y., exhibited the "J. & H." surface tanned sewing machine belting, a patented check ring spring, for tying up underwear in dozens in mills where the coupon system is used, as well as two grades of a stainless oil, an interesting line of counting glasses, and an automatic belt clamp. They also distributed samples of their excelsior and "new process" press boards.

The C. J. Root Company

The Parks & Woolson Machine Co., Springfield, Vt., were represented at the exhibition by W. W. Brown, the treasurer, and Fred C. Bryant, their Middle States representative. They had no machinery exhibit this year, but will undoubtedly be represented at the next show. These gentlemen were also in attendance at the meeting of the American Cotton Manufacturers Association in New York earlier in the week.

The Lunkenheimer Company, Cincinnati, O., exhibited their complete line of engineering specialties, comprising brass, iron, semi and cast steel valves, whistles, cocks, gauges, injectors, lubricators, oil pumps, oil and grease cups, water columns and automatic non-return boiler stop valves making a very interesting display.

The Boston Belting Co., Boston and New York, with offices in all the large cities, in Booth No. 178, exhibited the various supplies for the textile trades which they manufacture consisting of sheet, piston and special packings for all classes of work; braided and rubber hose for all purposes, gutabalata belting, cotton and linen hose and other supplies for which they are so well known to the trade.

H. V. Bishop, in charge of the exhibit of the Clipper Belt Lacer Co., Grand Rapids, Mich., stated that he was very much pleased to find so many tools in use in this vicinity. He had a great many callers who are users of this lacer, and reports business as very encouraging.

The contrast between the modern, up-to-date machinery shown in the exhibition and

The Lunkenheimer Company

that of 200 years ago was brought out by the exhibit of Mrs. J. N. Jackson, of Jamaica Plain, Mass., who was spinning yarn and weaving substantial fabrics on the stage, using the old spinning wheel and heavy wooden frame hand loom. A picture of Mrs. Jackson at the spinning wheel is shown on the front cover of this issue.

Lyon Mfg. Co., Fitchburg, Mass., showed an automatic bobbin stripper, with a feeler motion. The used bobbins are fed into the machine from an opening in the top, and come out cleaned, while the waste is deposited in a basket. They also exhibited a machine for cleaning roving bobbins, interme-

The Boston Belting Company

diates and slubbers. The booth was in charge of Alfred P. Cate and F. T. Camp.

Charles Lowinson, New York, exhibited thread counting glasses and other testing devices. Visitors showed interest in a new instrument called the Tachoscope, which is used for determining the speed of motors, shafting, etc. It will take all speeds.

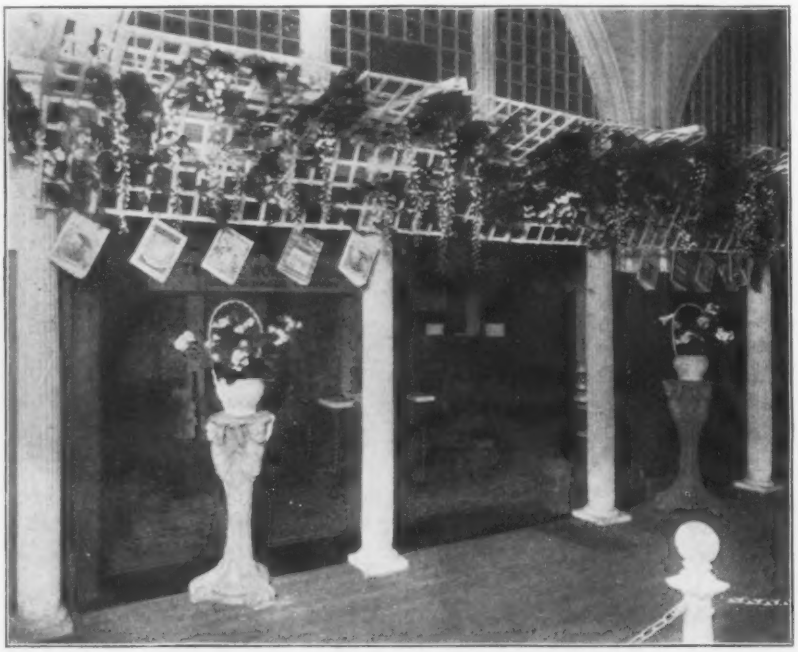
The textile publications were well represented. Their spaces were used as reception rooms for their friends and to display the various publications. A great deal of work had to be done in covering this exhibition and the newspaper men had a busy week. Besides the Textile World Record, other publications occupying spaces on the main floor were the Textile Manufacturers' Journal, American Wool & Cotton Reporter, Fibre & Fabric, Textile American, Textile Colorist, the Southern Textile Bulletin and Cotton and the Overseers' Review was in the gallery.

The Lord & Nagle Co., publishers of the Textile World Record, the Official American Textile Directory, other directories and textile books, were located on an aisle connecting the two halls. Their many visitors found this a convenient resting place and availed themselves of the conveniences offered. The members of the staff present included Frank L. Nagle, Henry G. Lord, Samuel S. Dale, A. H. Tyler, William J. Flesh, Clarence Hutton, J. J. McPhillips, C. T. Donlevy, Arthur R. Nagle, Henry T. Ross and Samuel D. Reed.

The Daily Trade Record of New York issued special news bulletins at frequent intervals during the day, giving the news of the convention and exhibition up to the minute. They were distributed gratis to each exhibitor and much appreciated.

The Leighton Machine Co., Manchester, N. H., builders of knitting machinery, were represented by Messrs. Gould and Rice of that concern, who paid several visits to the show and had an opportunity of meeting many of their customers.

The exhibit of the Lowell Textile School, Lowell, Mass., included machinery in operation, and examples of the various fabrics and yarns made at the school—cotton, woolen, worsted and silk; also photographs, charts, etc., showing the buildings and illustrating the work of the institution. The machinery consisted of a Noble comb, a two-headed cotton comb, and an automatic loom; also a small piece dyeing machine. The yarn exhibit included samples spun at the school from all types of cotton, from waste up to Sea Island, all run on the same side of a frame, with the Richards-Hinds Tube Roll, and a setting of one inch from center to center.



The Textile World Record

The New Bedford Textile School, New Bedford, Mass., showed samples from all its departments, weaving, designing, knitting, chemistry and mechanical, illustrating every process of cotton manufacture, from the raw

cotton to the finished product. In the weaving department many different weaves and designs were displayed, the work of first, second, and third year students; the designing department contained first, second and third year work, including Jacquard and color designs; in the knitting department the work was shown in process, and the finished garments was also displayed; the various dyestuffs, etc., used in the chemistry department, many drawings from the mechanical department, and photographs of the buildings completed the exhibit.

The exhibit of the textile department of the Clemson Agricultural College (Clemson College, S. C.), was arranged very attractively. In addition to the processes dem-

E. B. Badger & Sons Company

onstrated, and the yarns and fabrics shown, there was matter explaining the diseases and insects which destroy the cotton plant and seed. There was also a display of the product of South Carolina mills in which Clemson men hold positions. Large photographs and State flags were effectively used in the decorations.

Badger's self equalizing expansion joint for taking up expansion in long lines of steam pipe, a new product put on the market by E. B. Badger & Sons Co., Boston, Mass., formed the special feature of their exhibit which received considerable attention. They are also makers of copper work of all kinds,

The Joseph Dixon Crucible Company

fire extinguishers, jacketed kettles, bleaching and dyeing apparatus, etc., having been catering to the textile trade for many years.

The Jos. Dixon Crucible Co., known all over the country for their various lines of products, with Messrs. Guy W. Hart, Chas. A. Shall and W. L. Brooks in attendance, showed such of their products suitable to the textile trade as boiler graphite, lubricating graphite, belt dressing, motor brushes, textile crayons, silica graphite paint and greases, etc.

Among the visitors at the exhibition were noted: Lewis T. Shurtleff of the Pairpont Corporation, New Bedford, Mass.; Capt. H. L. Spence of the Metallic Drawing Roll Co., Indian Orchard, Mass.; Lewis F. Allen,

treasurer of the Salem Foundry & Machine Co.; G. B. Emmons, president of the Emmons Loom Harness Co., Lawrence, Mass., and Evan Arthur Leigh, of Leigh & Butler, Boston and Bradford, Eng. Mr. Leigh is in this country on a short visit and expects to return to England this month.

The Van Guilder Hollow Wall Company, Rochester, N. Y., exhibited the construction of a house with outside walls made of monolithic concrete practically on the principle of the thermos bottle—a house within a house. The air space between the double walls effectually insulated the building against cold in winter and heat in summer and from the dampness that penetrates ordinary walls.

The Mason Regulator Co., Boston, Mass., showed their various types of pressure regulating appliances. Among the many devices shown were reducing valves, pump regulators, balanced valves, damper regulators and one or two of their other specialties. These valves are all built for the automatic control of pressures.

The Power Show

The Second Annual Power Show, held in connection with the exhibition of textile machinery, was much larger than before, the entire basement being sold to power specialty concerns. The booths were attractively decorated and an orchestra added to the enjoyment of the visitors. A number of concerns handling power and transmission equipment, who have in the past exhibited on the main floor, retained their old spaces and their exhibits are reported under the Textile Machinery Exhibition.

The American Steam Gauge & Valve Mfg. Co., Boston, exhibited a full line of their gauges, valves, etc., consisting of American pressure or vacuum gauges, recording gauges, revolution counters, engine-room clocks and gauge boards, pop safety valves, relief valves, American Thompson improved indicators, American Ideal steam traps, and American H_2O grease extracting feed water filters. The company featured particularly their American Ideal steam trap, which they furnish for trial, without expense.

The Garlock Packing Co., 88 Broad St., Boston, Mass., exhibited a complete line of packings for every conceivable purpose.

Walworth Mfg. Co., Boston, power house piping material, gate valves, fittings, pipe bends, etc.

The Huile Company, Mechanicsville, Conn. showed lubricating oils and greases, and oils for special purposes, including wool oils and loom compounds; also, an "Oleic" oil, distilled from wool grease or degra.

Jenkins Bros., New York, with Boston office at 524 Atlantic Ave., showed a general line of valves for all purposes in the modern power and heating plant, including their specialties of mechanical rubber, "Jenarco" and '96 sheet packing and pump valves.

Warren Webster & Co., Camden, N. J., with Boston office in the Penn Mutual Building, exhibited the devices of the Webster Systems of steam heating, including modulation valves, sylphon traps, vacuum pump governors, suction and dirt strainers; also details of air washer equipment.

The Under-Feed Stoker Company of America, Chicago, with Boston office in the John Hancock Building, dispensed literature describing the Jones under-feed mechanical stoker.

The American Enameled Brick & Tile Company, New York, exhibited enameled brick of the standard colors, laid up in walls.

The Strong, Carlisle & Hammond Co. of Cleveland, O., with Boston office at 200 Congress St., showed their pressure traps, vacuum traps, automatic engine stop, quick closing valve, reducing valves, pump governors, excess boiler feed pump governors, steam and oil separators, and Mac-it set screws.

The Climax Smoke Preventer Co., Boston, showed a full-size model of a boiler front with Climax smoke preventer attached.

The Monarch Steam Blower Co., Troy, N. Y., exhibited a full-size model of one pass of a water tube boiler equipped with Monarch steam soot remover; also two rear flue blowers for return tubular boilers.

The Nashua Machine Co., Nashua, N. H., with Boston office at 127 Federal St., offered a practical demonstration of the Bundy steam traps, working under the varied conditions with which an engineer is daily coming in contact, and offering a solution of many troublesome problems.

The Watts Regulator Company, Lawrence, Mass.; steam and water specialties.

The Dearborn Chemical Company, Chicago, with Boston office in the John Hancock Building, distributed their literature on boiler compounds, oils, greases, etc.

The Thermograde Valve Company, Boston, represented the Consolidated Engineering Co., of Chicago, and demonstrated the Thermograde modulation system of heating, and the Van Auken system of vacuum heating, also showing a full line of the other heating specialties which both companies manufacture.

The National Tube Company, Pittsburgh, Pa.; Shelby seamless steel tubing, "National" pipe and boiler tubes, "Kewanee" unions, "National" Tube Company regrinding valves, various "Kewanee" specialties, etc.

Other concerns exhibiting included Ashton Valve Co., Boston; Autogenous Welding & Equipment Co., Springfield, Mass.; Burgmann Asbestos & Packing Mills, New York City; The Chapman Valve Mfg. Co., Boston; A. W. Chesterton Co., Boston; Climax Smoke Preventer Co., Boston; Combined Heat & Sprinkler Co., Boston; Coppus Engineering & Equipment Co., Worcester, Mass.; Cave Welding Co., Springfield, Mass.; Dahl Mfg. Co., New York City; Diamond State Fibre Co., Boston; Detroit Steel Products Co., Boston; Eagle Oil & Supply Co., Boston; Electric Smelting & Aluminum Co., New York City; The Evans Mill Supply Co., Boston; F. W. Foster & Sons Co., Boston; Gardner Grate Co., Roxbury, Mass.; The Garlock Packing Co., Boston; The Griscom Russell Co., New York City; Harrison Safety Boiler Works, Boston; Hinds & Coon, Boston; Jefferson Union Co., Lexington, Mass.; Keystone Lubricating Co., Boston; Lagonda Mfg. Co., Boston; Locke Regulator Co., Salem, Mass.; McClave-Brooks Co., New York City; McLeod & Henry Co., Troy, N. Y.; Monarch Steam Blower Co., Boston; National Tube Co., Pittsburgh, Pa.; Norristown Magnesia & Asbestos Co., Boston; Perfection Grate Co., Springfield, Mass.; Schaeffer & Budenburg Mfg. Co., Brooklyn, N. Y.; Shumaker-Santry Co., Boston; The Under-Feed Stoker Co. of America, Boston; Waldo Brothers, Boston.

A PRIZE ESSAY FUND

The Silk Association of America has announced a silk prize competition for the best written articles upon silk, which are submitted to the Secretary of the Association, 354 Fourth Ave., on or before June 1st, 1914.

The prizes aggregate $800.00, divided as follows: One first prize $200.00; three second prizes at $100.00 each; four third prizes $50.00 each; four fourth prizes at $25.00 each.

The competition is open to anyone interested in the silk industry and offers special opportunity to practical mill men. The conditions of the competition are most liberal and special attention is called to the fact that those unaccustomed to writing articles will be given equal chance and equal consideration. The awards will not depend upon penmanship, spelling, or the English used, nor upon the form in which the article is prepared, but will be based upon the practical value of its subject matter and the information furnished upon raw silk and its manufacture into any kind of goods.

The circular of information issued by the Association gives complete directions and may be obtained by application to its secretary. It indicates that in the awards, first consideration will be given to practical suggestions, discussions and opinions and that the opportunity for the active, progressive, well informed, practical man is just as good as for the customary writer of articles.

The Association includes with the circular of information the following list of topics for discussion:

SUGGESTED TOPICS

Changes in the making of skeins, books, bales, methods of packing, etc., which would assist the American manufacturer.

Most common defects found in raw silk, and the manner in which they affect the cost of production and the quality of product.

Difficulties in throwing raw silk of the various kinds and grades, and way in which the producer might overcome them.

Why silks wind badly.

Degree of irregularity found in bales of the same lot and chop and methods of determining it.

Defects found by the dyer in boiling off various grades.

Variation in the absorption of dyestuff and dyes by the different kinds and qualities.

Methods for the judgment of uniformity, luster, cleanliness and color.

Reasonable limits for the number of single and double ends in different grades of raw.

Inspection and testing of raw silk.

Qualities which the various grades should possess, and the possibility of defining and measuring them.

The New York Classification of Raw Silk.

The Yokohama Classification of Raw Silk.

Relation of Yokohama to New York classification and its defects.

The possibility of an International Classification.

Methods of determining grades of raw silk.

The purchase of raw silk on chop; advantages and disadvantages.

Difficulties met by the purchaser in determining the grade of deliveries.

National Cotton Manufacturers Convention

(*Continued from page 130*)

THE MILL STEAM PLANT

By A. G. HOSMER, 2313 Whitesboro St., Utica, N. Y.

HIGH BOILER DUTY

Among the first things to be mentioned in this class are the advantages obtained by operating boilers at a high rate of duty.

There is a time honored and prevailing theory that in order to run boilers economically they must be worked moderately, and the fuel burned at a low rate of combustion. While this theory may have been partially correct when considering the old types of cylinder boilers or those having few tubes and containing large bodies of water, it has been pretty thoroughly demonstrated that the perfect combustion of fuel cannot be obtained in this way, and also that boilers of modern design, whether of fire or water tube types with their water spaces divided into sections of small area,

A. G. HOSMER

cannot be economically operated over fires in which the heat is not kept practically uniform and at a high temperature. In spite of this fact there are many mill boiler plants which are operated in the moderate way.

Probably the majority of boilers throughout the country are working at a pace below their regular rating for a greater part of the time, and while it may be conducive to long life for the equipment and a consequent small repair expense, this feature cannot possibly affect the great savings which can be made by adopting the high duty method.

That the forcing of a steam boiler to a point far beyond its normal capacity is neither injurious to the boiler or a wasteful practice is well illustrated by tests made upon a water tube unit in New York City, where additional boiler power was wanted immediately and there was no available room to spare for additional equipment. This boiler was provided with grates which contained approximately twice the surface of the regular grate and intense fires were kept up continuously for a considerable length of time. The results obtained show that the output of steam was more than doubled, and that the efficiency was but little below the ordinary. The boiler also stood up well and gave no perceptible evidence of the strenuous treatment to which it had been subjected.

ARTIFICIAL AIR SUPPLY

A boiler plant with good natural draft is usually considered the best and most satisfactory arrangement that can be secured, and yet in principle this is entirely wrong, and carries with it many serious objections which can never be overcome.

With natural draft the movement of all waste gases and the accompanying supply of air for combustion are wholly dependent upon the chimney, which must overcome the existing friction along a more or less sinuous passage extending to the ash pit of the most remote boiler. As this draft or suction produces a vacuum throughout the course, any aperture through boiler settings or connections, however small, will draw in air from the outside and by "short circuiting" cool or chill any heated surface it may come in contact with and by lowering the temperature of the gases reduce the intensity of the chimney suction.

When fuel is fed upon the grate, the open door affords opportunity for a large volume of cold air to rush in and impinge upon the heated surfaces which but an instant before were exposed to the intense heat of the most fiercely burning part of the fire and these changes of temperature must be detrimental to the best economy and injurious to the exposed portions of the boiler.

Such conditions prevail in every natural draft steam plant, the baneful effects varying according to the amount of air leakage, time boiler doors are open, differences in temperature, etc., increasing in evidence as the intensity of draft and duty upon the boilers increases. If, without disposing of the chimney, we add to the equipment a device for furnishing the air required for combustion and apply it under a slight pressure at the ash pits, we can supply the power to move the gases from the grate through the passes of the boiler and here deliver them to the chimney suction. In this way we have moved the generating force required to supply the air to the proper side of the fire and done away with the objectionable features connected with depending upon chimney draft alone. Another thing has also been accomplished —the process and intensity of combustion has been brought under control.

Anyone who is conversant with the handling of natural draft boiler plants of large size knows well how unwieldy they are in the matter of controlling the rate of steam generation, especially where

the load at times fluctuates, and probably knows how inadequate any automatic damper regulator or other appliance attached to the chimney is when it comes to keeping the steam pressure within a close range. With the artificial method, by operating directly upon the fires themselves and not by the way of the long passages through the boilers, it is evident that a different principle is employed and that the rate of combustion can be governed to a nicety.

Another advantage gained is that the velocity of the heated gases is greatly reduced and instead of being rushed past the heating surfaces of the boilers at an excessive speed impelled by the energetic chimney at the far end they are allowed to linger in contact with the receptive plates or tubes and are moved along at a moderate pace according to the rate of combustion required.

This method of forced or balanced draft is especially valuable when it is necessary or desirable to use the cheaper grades of fuel, as any intensity of air pressure can be obtained, and in one plant in mind it has proved of great assistance in handling the harder grades of bituminous coal which are burned with difficulty in furnaces having a moderate natural draft.

A further desirable feature is that the air for combustion may be preheated by utilizing waste heat from any source and a considerable saving realized, as every degree gained by this method will save a degree usually applied by the fuel on the grates.

HIGH PRESSURE STEAM AND SUPERHEAT

By adding a comparatively small amount of heat to the boiler steam when at eighty pounds its pressure can be doubled and its efficiency greatly increased as a generator of power at very little extra cost.

This fact is almost universally known, but in the actual operation of many steam plants designed and built expressly for making steam at high pressure, a reduction of from ten to fifty pounds from the possible working pressure is allowed.

Maximum efficiency cannot be realized by this practice, and it should not be permitted unless certain special conditions require it; as for instance engines working under light loads which by an excessively short cutoff allow the expansion lines to drop below the terminal exhaust pressure before the stroke is completed.

Although, as said, the benefits derived from using high tension steam for power purposes are generally known, its superiority and economy for manufacturing purposes is little appreciated.

In almost every plant where steam is used for slashing, dyeing, drying, etc., much, if not all of the apparatus is situated at some distance from the boilers and if the steam supply passes through long lines of pipe at a low or moderate pressure there is always quite a percentage condensed. Except in special cases, a mixture of steam and water is not a desirable element to introduce into a drying cylinder or a heating coil and is not particularly efficient when used in a dye bath. If on the other hand the steam is generated at high pressure and reduced at the machines (or as close as possible to them) to the pressure required in each particular case, the condensation will be slight, comparatively speaking, and this will be further lessened by the excess heat contained in the high pressure steam causing reevaporation at the reducing point.

An excellent proof of the great savings made by adopting high pressure steam for use in manufacturing is afforded by the experience of a large paper mill company who, having a group of mills with separate boiler plants working under medium pressure, centralized their steam equipment at one point and carried the steam at high pressure in the manner described several hundred feet in some instances to the various departments.

The pecuniary gain made by the increased efficiency of the boilers and the employment of high pressure, it is claimed, was seventy-five dollars per day, the plant containing 2,400 boiler horse power.

The amount of superheat necessary or profitable in connection with the operation of engines or turbines is a question upon which there is much controversy and it is too complex to be considered here.

It is, however, pretty generally conceded that superheat when used moderately is a valuable asset.

It is also valuable for manufacturing purposes, as it enhances the reevaporative power of the high pressure steam when it is reduced and carries the economical conditions one step farther toward the ideal.

PREVENTION OF DECAY IN MILL TIMBERS

BY F. J. HOXIE

Engineer and Inspector, Associated Factory Mutual Insurance Companies, 31 Milk St., Boston, Mass.

Hard pine has been used for the floor beams for the past fifty years, and have given satisfactory service in all respects until within the last five years when dry rot has appeared with such frequency as to demand investigation. Twenty cases have been brought to the attention of the Factory Mutual Fire Insurance Companies within this period. The damage has varied from a few hundred to nearly a hundred thousand dollars. All common varieties of timber have been attacked, but yellow pine most frequently, as that is in most common use for mill frames.

The cause of this rapidly increasing destruction is unquestionably the use of poorer timber than in former years. The frame of a new mill is now rarely seen, of which North Carolina, shortleaf or Cuban pine do not form a considerable proportion. The best qualities of heart wood of these varieties are probably as resistant to rot as longleaf pine, but they are less uniform and the poorer qualities are generally more difficult to detect.

In textile mills, the high artificial atmospheric humidity undoubtedly increases the tendency to rot. With 70 per cent. saturation of moisture and a temperature of 80 per cent. Fahrenheit in a weave room, a decrease in temperature of 12° or more will cause precipitation of moisture. This condition is frequently found in cold weather at roofs, windows or bearing ends of beams in the brickwork.

It is generally agreed that rot in wood is caused by growth in the cells of a lower order of plant

called a fungus, belonging to the same family as the toadstools and mushrooms. A large variety of fungi can grow on wood under favorable conditions, but only two or three are concerned in the destruction of mill timber. Two of the commonest are shown in Figs. 1, 2 and 3. A different class of fungi which destroys railway ties is rarely found in factory timber.

No fungus can grow without water; the dry rot fungus can grow on the surface of wood at an atmospheric moisture of 96 to 100 per cent. of saturation. It can undoubtedly grow inside of large mill beams of susceptible material at a much lower percentage saturation. In one case which was investigated, the room was maintained at less than 70 per cent., and second floor beams which were not exposed to the outside air were attacked. Experiments have been made which tend to show that the dry rot fungus is able to provide sufficient water for its requirements in beams of large size by decomposing the wood.

Twenty-six varieties of hard pine are described by Penhallow, as growing in North America. Of these only four are much used for timber in the eastern states. The four timber varieties, the longleaf, shortleaf, Cuban and North Carolina are very fully described in "Timber Pines of the Southern States," by Mohr. The longleaf pine has proved more valuable for timber than the others owing to its greater strength and durability. The latter quality is probably chiefly the result of the high percentage and uniform distribution of the rosin and the small percentage of sap wood, the sap wood of the longleaf pine averaging about two inches in radius of mature trees, while that of the other three varieties varies from 4 inches to 6 inches of the radius.

In a recent trip through the longleaf pine forests of Louisiana, Mississippi and Alabama, I found it evident that longleaf pine of suitable sizes for mill timbers can be had at reasonable prices. It remains to make specifications defining the qualities required when a bill of timber for a cotton mill, or other important structure is sent out by the designing engineer or architect to be sure of getting timber that is strong and durable. Evidence of the inadequacy of the specifications now in common use is plain in many ways.

I found in all cases shortleaf pine growing in the same forests with longleaf and cut by the same mills, which tends to disprove the statement of a well-known authority that the place or origin of timber, as shown by the bill of lading, serves as a suitable safeguard. It is not enough that the most of a lot of timber shall resist fungus to secure a safe structure. All of it must be resistant. In no case investigated has all the timber of the mill rotted.

The need of more definite specifications for mill timbers and columns, I find, is appreciated by the lumber manufacturers who produce good timber. Many examples were given by the manufacturers where timber bought as shortleaf had been sold by middlemen as "longleaf," or "merchantable" sold as "prime" and of "square edge" sold as "merchantable."

The lower grade of hard pine timber called "square edge and sound" does not pretend to be longleaf pine. All varieties (longleaf, shortleaf, Cuban and loblolly) are manufactured indiscriminately into this grade. Its durability cannot be depended upon without antiseptic treatment. One of the most serious cases of rotting which has been investigated was undoubtedly due to the use of this grade of lumber in filling a specification calling for "the best quality longleaf Georgia pine."

Practically no timber for use above the basement in cotton mills has thus far been given antiseptic treatment, therefore recommendation made for such treatment must be founded upon experience gained from timber used for other purposes. Experience derived from time tests is all-important in connection with timber treating processes. The chemistry of the wood, that of many of the treating materials and the combination of wood and treating materials is so complicated and little known that theoretical prognostication is of little value for the long terms of years which treated timber should last. Many experiments have been made on treated wood for railway ties and telegraph posts. These experiments apply to factory timber only in a general way, owing to the entirely different conditions under which it is used, but thus far they are all that we have to guide us in the selection of a suitable antiseptic process.

Coal tar compounds which have given excellent results on posts and ties have several objectionable qualities when applied to cotton mill timber. Most of them undoubtedly increase the fire hazard somewhat, they leave a black, greasy surface and have a disagreeable smell.

Creosote compounds superficially applied to cold material have little value when used on timber which is highly susceptible to fungus, as it is frequently already so deeply infected that the surface treatment cannot reach the living fungus within the large beams. Deeply creosoted timber has unquestionable value for use in damp locations where the fire hazard is not great, such as basement floors and about paper mills and dyehouses. The cost of such treatment is from $12 to $20 per M. in addition to the cost of the untreated material.

RECENT DEVELOPMENTS IN INCANDESCENT LAMPS AND THEIR APPLICATION TO COTTON MILL LIGHTING

BY G. H. STICKNEY

Vice President Illuminating Engineering Society, Edison Lamp Works, General Electric Co., Harrison, N. J.

The recent history of incandescent lamp manufacture reveals two very conspicuous advances which have greatly increased the economic possibilities of good artificial illumination in cotton mills. I refer to (a) the use of tungsten as a filament material and (b) the development of the wire drawing method of forming the tungsten filaments.

TUNGSTEN FILAMENTS

As is well known, the use of tungsten as a filament material meant a big increase in the efficiency of incandescent lamps; in fact, the increase was so great that many people have failed to real-

ize its real economic significance. An increase of two or three per cent. in the efficiency of an electric generator or dynamo is considered very important, and manufacturers spend thousands of dollars to secure such an advance, and discriminating buyers are willing to pay more for machines which will show such economies. The tungsten filament doubled the efficiency of the preceding incandescent lamps, and increased the efficiency two and one-half to three times over that of the carbon lamps, which were in most common use. This meant that two and one-half to three times as much light as formerly could be

G. H. STICKNEY

produced from the lighting dynamo, without any considerable increase in investment.

The tungsten lamp was, however, handicapped by the fact that the filament was more fragile than the carbon filament, and hardly sturdy enough for cotton mill service.

Then came the second advance. Long and arduous investigation in the research laboratory in Schenectady finally solved the problem of producing tungsten in a ductile form, so that it could be drawn into a wire somewhat after the manner of other ductile metals. This immediately resulted in the strengthening of the lamps so that they would withstand reasonable usage and handling such as would be encountered in a mill.

In the manufacture of drawn wire filaments it was found possible to secure a homogenity of material and a uniformity of diameter away beyond anything ever obtained in making filaments either of carbon or tungsten by the extruding process. This elimination of weak points not only made it possible to operate filaments at a higher temperature and hence higher efficiency, but also to predetermine the performance of the lamp. Formerly in making up a lot of lamps intended, say, for 115 volts, individual lamps were produced ranging all the way from 110 to 120 volts, from which the lamps had to be selected for voltage by photometric test. It is now possible to make lamps more accurately for voltage than they can be selected by the photometrist. This means better lamps for the circuits and lower prices.

Besides the two important developments already mentioned, minor improvements have continually followed each other in rapid succession. Most of these have escaped public notice, but they have, in the aggregate, improved the performance of the Mazda tungsten lamp nearly, if not quite as much as the two well-known developments.

Some of these improvements have emanated from the research laboratory, where a corps of scientific investigators are constantly studying the problem of lamp betterment. Others have been the result of experience and experimentation in the manufacturing departments. Proportions of lamp parts have been changed: different materials have been tried in various parts of the lamp, and thousands of variations in methods and processes have been tried out. Every year thousands of lamps are used up in life tests to check the quality of the standard product and the value of various improvements. The continual improvement is illustrated in Fig. 1, which shows the increase in efficiency in the 110 volt, 100-watt Mazda lamp. The increasing strength of the filament is indicated in Fig. 2, showing the relative maximum deflection of filament before breaking, as determined by tests on lots of lamps for each year since 1908. The break in the curve is due to the drawn tungsten wire.

Not the least of the advantages which have accrued from these many improvements has been the reduction in costs and the consequent lowering of selling prices. Fig. 3 gives curves showing the list prices of some of the standard lamps since 1907. It will be noted that the 250-watt lamp now costs somewhat less than the 100-watt did seven years ago.

In the early lamps, water vapor was one of the obstacles to the manufacture of better lamps and an element of uncertainty. By a sort of recurrent action, it served to carry particles of tungsten from the filament and deposit them on the bulb, and so blackening it. It was found that no matter how thoroughly a lamp was exhausted, if subsequently the temperature of the bulb were raised above that at which the exhausting took place, more vapor would be driven off and blackening would occur.

More recently the limitation of improvement in Mazda lamps has appeared to be due not to defects or impurities of any sort, but to the fact that we seemed to have reached the physical limit of refractory power of the tungsten itself. Through the discovery and elimination of imperfections, it had been possible to increase the operating temperature of the filament, and therefore the efficiency of lamps, to such a point that, although less susceptible to such action than any of the other filament materials, the tungsten itself would

slowly vaporize and form a light-absorbing deposit on the bulb. However, again the scientist has found another possibility which bids fair to rank in importance with these two developments which we have particularly discussed.

It is well known that materials volatilize at a lower temperature in a vacuum than at atmospheric pressure. Mr. Edison experimented with nitrogen gas in carbon lamps nearly thirty-five years ago. However, he found that the gas cooled the filament so much by convection that the lamps were less efficient than when the filament was run in a vacuum. This might have been expected to hold for the tungsten filament, and in fact does for low amperages, but it has been found possible, with improved materials and methods, to make lamps for high currents in which the increased efficiency due to high temperature of filament much more than compensates for the convection loss. Thus, at 20 amperes, Mazda lamps consuming but one-half watt per mean horizontal candle power are commercially available. With lower currents, the advantage of the new process is not so great, so that, for 110 volts, the 750 and 1,000-watt lamps consume respectively .65 and .60 watts per mean horizontal candle power. As these lamps are of too high a capacity to be of great interest in mill lighting, further detail is omitted.

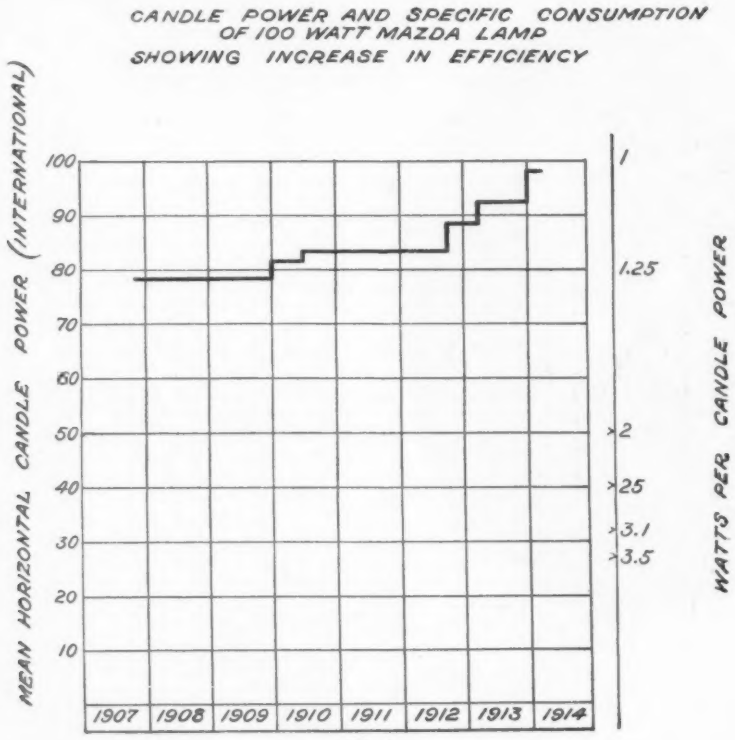


FIG. I

REFLECTORS

One of the great advantages of the modern incandescent lamp is the great variety of reflecting devices available, by the use of which the light may be distributed to meet almost any conceivable requirement. It is seldom desirable to use an incandescent lamp without a reflector, while the selection of a proper reflector may increase the effectiveness of the lighting very materially.

The reflector may perform three distinct functions, besides serving as a protection for the lamp. First, it may concentrate a large portion of the light on the working surfaces, where a high intensity is needed. Second, it may keep the direct light out of the eyes, thus avoiding the glare which is encountered with any of the efficient light sources, and third, it may help diffuse the light, softening shadows.

Industrial reflectors are often classified in accordance with their characteristics of light distribution. The following are the types of distribution most commonly used in mill lighting:

1. Intensive,—maximum candle power about 30° from nadir.

2. Extensive.—maximum candle power about 45° from nadir.

3. Distributing.—high candle power about 60° from nadir.

4. Focusing.—maximum candle power about 0° from nadir.

These characteristics should be taken into account in designing the lighting installation, especially in regard to the height and spacing of lamps.

While glass reflectors are occasionally used to good advantage in cotton mills, the usual practice is to use steel. Two types of reflecting surfaces are in common use: namely, aluminum and porcelain enamel. When reflectors are exposed to grease, smoke, etc., the porcelain reflector is generally preferred, as the coating is practically of glass and more easily cleaned. The aluminum finish costs less and is not likely to chip off. There is considerable difference in the quality of reflectors of different makes, both in the aluminum and enamel finishes. This affects both the durability

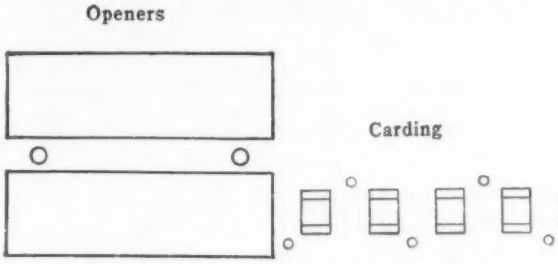


FIG. 4 FIG. 5

of the material and its efficiency as a reflector. In order to secure best results care should be exercised in the selection of reflectors.

CLEANING

The accumulation of dust and dirt on lamps and reflectors detracts considerably from the light furnished. Losses as high as 50 per cent. have been shown by tests under severe conditions. It

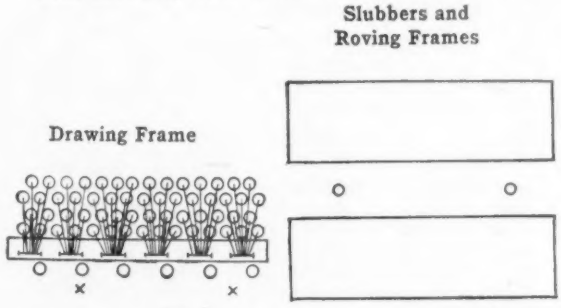


FIG. 6 FIG. 7

is therefore important that the light-transmitting and reflecting surfaces be kept reasonably clean. Since the depreciation is so slow, its magnitude is seldom realized and cannot be taken care of by haphazard cleaning. The only real way to assure proper illumination performance is to establish a systematic arrangement for periodic cleaning, and this can be done at a surprisingly small cost.

LIGHTING PRACTICE

In industrial lighting there are four principal methods of lighting: namely, by general illumination, by localized illumination, by combined general and localized illumination, and by localized-general illumination or group lighting.

GENERAL ILLUMINATION

Represents the practice where an attempt is made to distribute an even intensity of illumination throughout an area. It originated with the application of arc lamps to interior lighting, but is now frequently applied with the higher power incandescent lamps.

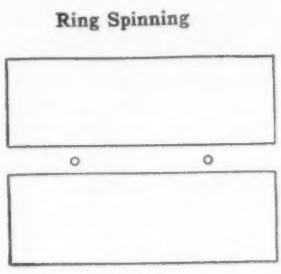


FIG. 8

LOCALIZED ILLUMINATION

Applies to the practice of locating small lamps near the surfaces to be lighted. This practice was common with carbon incandescent lamps.

COMBINED GENERAL AND LOCALIZED ILLUMINATION

This, as its name implies, is a combination of the two preceding types of practice. Usually a moderate general illumination is supplemented by higher intensity of localized illumination at particular points. Its application is obvious. While the general tendency is away from localized lighting, there are conditions in which no other form of lighting seems to give as satisfactory results.

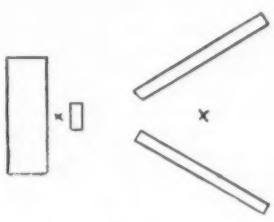


FIG. 9

LOCALIZED-GENERAL ILLUMINATION OR GROUP LIGHTING

This, as its name implies, is a combination of and localized lighting made possible by the range of intermediate sized Mazda or tungsten lamps. Instead of trying to produce an even intensity throughout the room, the lighting is arranged so as to produce maximum intensities at the most important points, at the same time avoiding objectionable shadows. In other words, the lighting units are located with reference to processes and machinery.

All of these methods of lighting have been used in cotton mills. Formerly the localized method was predominant; this was followed by general illumination and the combined method. Today, however, the localized-general method is gener-

ally preferred, although there are some excellent installations of general lighting.

No single practice suits all classes of cotton mill lighting. There are bound to be variations, just as there are differences in quality of product, dimensions of rooms, types and arrangements of machinery, costs of power, etc. Even the class of labor employed may have an influence on the amount and kind of lighting which is most suitable. The following recommendations have been decided upon by my associates and myself as suiting average conditions, under which they have given satisfaction. For very fine or colored goods, higher intensities will be required, while with coarser gauges a lower power lamp may, in some cases, be permissible. The recommendations are based upon the localized-general method of illumination, although in some cases they approach very closely to general illumination.

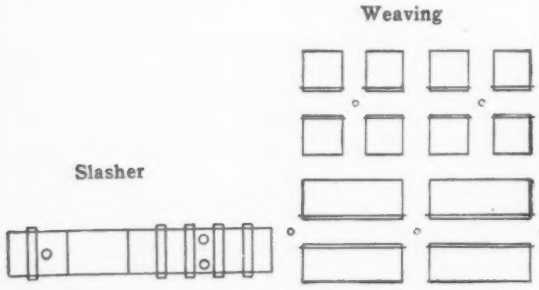


FIG. 10

FIG. 11

In applying the following, lamps equipped with dome reflectors should be hung as nearly 12 feet from the floor as the ceiling height will permit. If hung too low the glare is likely to be objectionable, especially where processes require close inspection. The bowl reflectors cover up the filament so as to protect the eyes from intense brilliancy. When bowl reflectors having extensive distribution are used, they should be suspended about 8 feet above the floor, while those having intensive distribution should be 10 to 11 feet above the floor. The use of Mazda tungsten lamps is assumed.

PROCESSES: OPENING AND PICKING

One 40-watt lamp with extensive bowl or dome steel reflector, suspended at each end of each machine, as indicated by O, Fig. 4.

CARDING

Forty-watt lamps with extensive bowl reflectors, staggered along row of cards, as indicated by O, Fig. 5.

DRAWING

Two 40-watt lamps with extensive reflectors in front of each frame, spaced one-quarter length of each machine frame each end. Location indicated at X, Fig. 6.

SLUBBERS AND ROVING FRAMES

Two 40-watt lamps with extensive or distributing reflectors between machines, as indicated by O, Fig. 7.

RING SPINNING, TWISTING AND SPOOLING

Sixty-watt lamps with extensive reflectors in aisle, spaced one lamp for every hundred spindles on each side. Fig. 8; O shows location of lamps.

WARPING

When warpers are movable, use general illumination with 60-watt lamps, extensive reflectors on 8 to 10-foot spacing. Otherwise, one 60-watt lamp with intensive reflector over beam, and one 60-watt lamp with intensive reflector between racks. See X, Fig. 9.

SLASHING

Forty-watt lamps with extensive reflectors at each end of machines, as indicated by O, Fig. 10.

DRAWING IN

Use general illumination with 40 or 60-watt lamps (depending upon the gauge of warp), with extensive reflectors, spaced about 10-foot centers.

WEAVING

For looms weaving up to about 52 inches, use one 60-watt lamp with extensive reflector for four looms. Locate units as shown by O, Fig. 11.

For wide looms weaving up to 72-inch goods, one lamp with extensive reflector for two looms. See O, Fig. 11, lower part. For colored or fine goods, use 100-watt lamps. Objectionable beam shadows are likely to be encountered with general illumination from large units.

INSPECTING

An intensity of about 4-foot candles should be provided for white goods. One 60-watt lamp with extensive reflector is usually hung over each table, but when colored goods are to be inspected a 100-watt lamp is recommended.

PACKING AND SHIPPING

A general illumination provided by 60-watt lamps with dome type (distributing) reflectors on 10 or 12-foot spacing will be sufficient.

MILL OFFICES

For large general offices, lamps with prismatic or opal glass reflectors, with a power consumption equal to 1.2 to 1.3 watts per square foot of floor area, will provide ample illumination. Spacing should not exceed 10 or 12 feet. When desks are permanently located, it is sometimes advantageous to locate lamps over front edge of a line of desks.

HALLS AND STAIRWAYS

In the interest of safety it is very important that at least a low general illumination be provided, especially in the halls and stairways by which employes leave the buildings. Owing to the variety of construction, no general recommendation can be made but, as a rule, a lamp should be placed at each landing and angle. Especially on stairways it is important to select the location and equipment so as to illuminate the steps without casting a blinding glare in the eyes of those descending. This can be more easily accomplished if the lamps are equipped with reflectors rather than used bare, as is so often the practice.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

EUROPEAN METHODS OF CARBONIZING RAW STOCK AND PIECES

BY ROBERT DANTZER

Translated from the French by the Editor of the Textile World Record

(Continued from April.)

This oven is based on the counter current principle, the hot air moving in a direction opposite to that of the wool which is being dried. This avoids exposing the material to an excessively high temperature since it comes in contact at first with the air of which the temperature has already been lowered during the passage through the other compartments. Under the influence of a temperature of 212° to 250° F. the acid becomes concentrated on the vegetable material, which turns black and then brown, becoming brittle so that it can easily be crushed into dust.

The carbonized vegetable material is reduced to dust by passing the wool through the crushing machine and duster shown at Fig. 6. This machine consists of a series of corrugated rolls arranged in pairs, the pressure being obtained by powerful springs. The rolls reduce the vegetable material to dust. The wool is delivered from the rollers to a duster, the dust being removed by the fan placed above the cylinder, as shown. The wool is delivered free from dust at the opposite end of the machine. The wool is next run through a four-bowl rinsing machine similar to that shown at Fig. 2. The first bowl, which is lined with lead, and the next two bowls contain tepid water. The last bowl contains a solution of soda at 5° Be., to which is added a small quantity of carbonate of ammonia, which neutralizes the acid remaining in the wool. After washing the wool is extracted by a pair of squeeze rolls mounted on a separate frame similar to that shown at Fig. 3. If the wet wool that has passed through this machine is placed on litmus paper it should not turn the latter red. If it does redden the litmus, the wool should be rinsed again until all trace of the acid is removed.

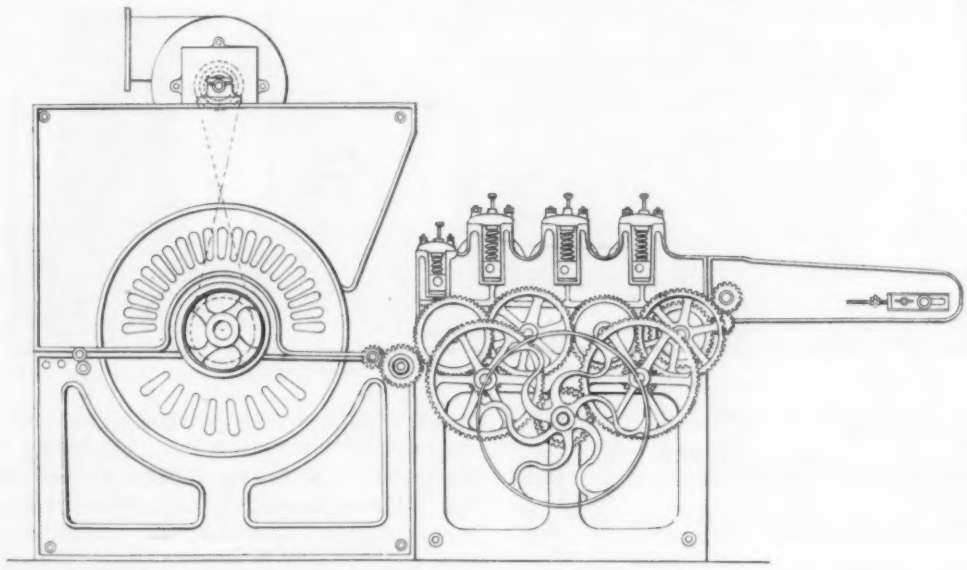


FIG. 6. A CRUSHING MACHINE AND DUSTER

The wool is now dried in a machine similar to the carbonizing machine, except that the heater has a heating surface of only 1,100 square feet.

A carbonizing plant to handle 4,000 to 5,000 pounds of wool in ten hours should consist of the following equipment:

One double opener, 3.20 by 2.18, net weight, 2,150 kgs.
One five-bowl scouring machine, 29.50 by 3, net weight, 28,000 kgs.
Two acid tanks, 2.50 by 1.50.
Two hydro-extractors, 1.32 by .32, net weight, 1,575 kgs. by 2.
One opener, 2.18 by 2.20, net weight, 600 k.

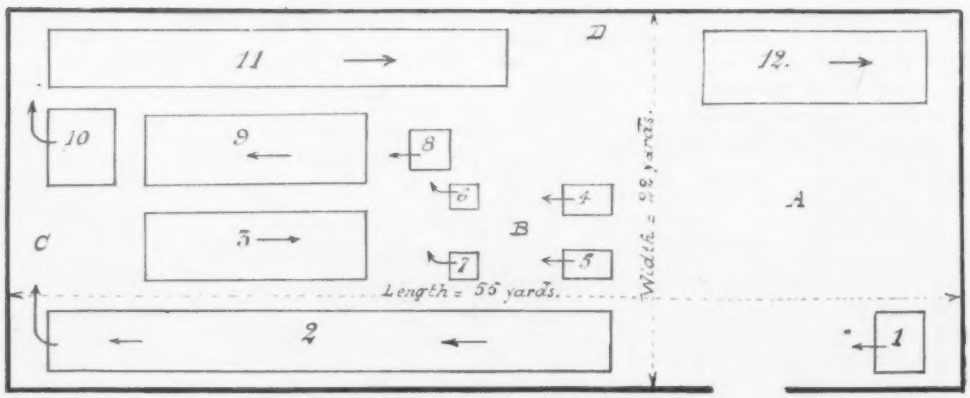


FIG. 7. PLAN SHOWING ARRANGEMENT OF MACHINES

One carbonizing machine, 11.60 by 3.60, net weight, 15,700 k.
Two dryers, 11.60 by 3.60, net weight, 15,700 k.
One washer and duster, 3.50 by 3.90, net weight, 3,800 k.
One four-bowl rinsing machine, 24 m by 3 m, net weight, 20,000 k.

Fig. 7 shows these machines arranged in one room, the references being as follows: 1, double opener which should be enclosed in a separate room on account of the dust. 2, five-bowl scouring machine. 3, dryer. The wool between the scouring machine and dryer is stored in a pile or in trucks. 4 and 5, acid tanks. The wool coming from these tanks is thrown in a pile at B, ready to be extracted in the hydro-extractors, 6 and 7. 8, wet opener. 9, carbonizing machine. 10, crushing machine and duster. 11, rinsing machine. 12, dryer. The open spaces, A, B, C, and D, enable the wool to be stored between the different processes. When a very large quantity of wool is handled, it will be found advantageous to provide some automatic means for transporting it so as to reduce the cost of handling.

The Snoeck carbonizing machine is the principal one used, but there are a number of other systems, including those of Gautillon and Hubert, Orval, Simones and Chapuis, Silverberg and Cunibert, Dupont, James and Edgard Fitton, Cornell Allen, Demense & Co., MacNaught, Bourry and Raulin, and others.

Carbonizing with Acid Gases

The use of hydrochloric acid gas enables the temperature to be lowered to 70°, which serves to retain the softness and luster of the wool. The latest apparatus used for this purpose consists of a cement or masonry chamber provided with openings to give access to the interior. The wool to be carbonized is placed on racks. The gas is liberated at the bottom of the chamber and rises to the top after passing through the material. The acid is generated in retorts heated by means of large tubes. The Schuell apparatus is also used and consists of a large circular drum made of slats or perforated metal and enclosed in a chamber of masonry. I prefer the Schirp carbonizing machine, Fig. 8, which has a number of important advantages. The hydrochloric acid is heated in the retort, B, by aid of the furnace, d, and passes to the perforated drum. A, through a hollow shaft, i. The apparatus is arranged so as to generate the acid uni-

formly and it does not escape into the work room. An ingenious arrangement enables the acid to be fed automatically into the retort. At the end of the retort, F′, is a feed, g, which closes automatically at each turn of the drum. When the feed pipe, g, is raised above the shaft, the acid flows slowly through the pipe, f′, into the retort, B, where it is converted into gas, an automatic arrangement preventing the escape of the gas except through a hollow shaft, i, into the perforated drum, A, which revolves from two to three times a minute.

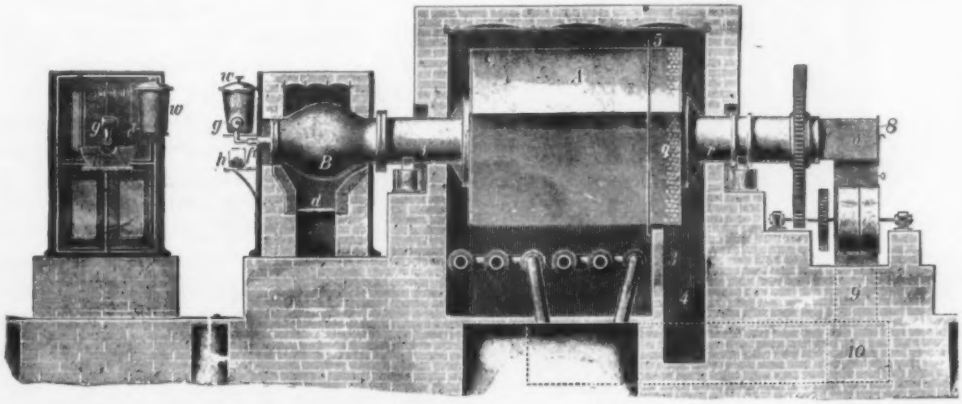


FIG. 8. THE SCHIRP CARBONIZING MACHINE

One advantage of this machine consists in vaporizing the acid outside the carbonized chamber at the end of the hollow shaft on which the drum is mounted. A globe, B, forms a continuation of the shaft, and is heated by a flame at (d). The acid is first carried into the globe, where it is converted into gas, which passes through the pipe, i, into A, where it effects the carbonizing of the material. The acid is introduced by an automatic arrangement consisting of a small pipe, f′, at the end of the globe. At the end of this small pipe a scoop or spoon is fastened, and revolves with the shaft; as the spoon descends it is filled with acid from the tank, h, into which it dips. Upon rising an automatic device in the pipe permits the acid to run into the globe, where it is vaporized by the heat of the flame and passes to the carbonizing drum. W is a tank from which the holder, h, is filled with acid.

(To be continued.)

BEDFORD CORD FOR THE BRITISH ARMY

BY COCKNEY

The manufacture of Bedford cords for clothing the mounted men in the British army presents a number of difficulties. One of the most difficult problems is the strength. The test is a severe one, both for warp and weft. There is no stronger or better wearing cloth made in woolens. Cotton threads are employed to get the clear cut between the ribs of the cloth. Worsted or woolen would not make the sharp break which is characteristic of a good Bedford cord. The manner in which the cotton threads are worked has an important bearing on the strength of the cloth when finished. The writer has seen cords made from the same yarns and on the same looms, weighing the same, and to all intents and purposes identical, but showing a great difference in the strength. The highest strength possible depends on having the cotton cutting threads just the right length in the piece. In order to determine the proper length the elasticity of the woolen yarn is first ascertained. The cotton cutting ends should measure the same length in the finished piece as the woolen yarns at their utmost elasticity or at the breaking point.

If the cotton threads are put upon the same beam as the woolen yarns the former will be too long. Under such conditions the cotton threads do not bear their share of the strain when the cloth is tested for strength.

If the cotton is too short in the finished piece the cotton bears the strain before the woolen threads have been fully extended. The result is that the cotton breaks before the strain comes on the woolen threads, and the woolen threads are not able to bear so great a strain, being unassisted by the cotton. If the balance is properly adjusted when the woolen yarns are fully extended,

A PATTERN OF A BEDFORD CORD

then the cotton yarns come into play and begin to bear their weight, and the combined resistance of the two sets of yarns gives a greatly increased breaking strain.

I have known of cases in which the fully extended woolen yarns have been some 6 per cent. shorter than the cotton threads. As a result the woolen yarn breaks before it has received any assistance from the cotton. In other cases the cotton was 6 per cent. shorter than the fully extended woolen yarn. The cotton bore all the strain unaided and broke before the woolen yarn could afford material assistance. If the cotton yarn is so adjusted as to be about the length of the extended woolen threads, then the cotton and the woolen help each other, and the cotton gives an increase in the strength of the cloth warp ways. For this reason the cotton threads should be put upon a second beam, but even then the elasticity and breaking point of the woolen yarn must be known, so as to make the letting off of the cotton a matter of accuracy.

The illustration shows a pattern of Bedford cord used in the British army, the specifications for which are as follows:

Weight 17 1/2 to 18 ounces 28 inches wide. Warp, 92 ends per inch. Filling, 80 picks per inch finished. Strength 450 pounds warp ways, and 320 pounds filling ways. Elasticity of warp 3 inches, of weft 4 inches. Tested on a machine of 6 5/8 in. by 9 in. gauge, 7 inches between clamps.

[The actual weight of the sample received with this article is 16.8 ounces per yard, 28 inches wide.—Ed.]

ENGLISH NOTES

By Our English Correspondent

A list abbreviated from British export returns is given below to sum up the quantities shipped to America during the first three months of the year. On closer examination the gross increase of 7 1/2 million yards of cotton piecegoods is found to be made up of gains of 4 1/2 million yards of dyed cloth, 2 1/2 million of bleached and 1/2 million of printed goods. The worsted yarn is of an average value of 62 cents, which is approximately the same average as a year ago. The woolen tissues average 80 cents a yard, indicating a high average of quality. Makers of fine worsteds have acknowledged gratefully an improvement in American orders that has been especially welcome in the face of the dull state of domestic demand, but it is clear from the value of the 10 million yards that the quantity includes a heavy preponderance of dress goods; the average value is only 30 cents. As the mixed broad silks work out at about 35 cents a yard it is clear that they belong largely to the order of cheap dress goods.

Quantities Exported to U. S. from U. K. in 3 Months, January to March

	1913	1914
Cotton yarn .....lbs.	1,684,400	1,772,500
Cotton piece goods .... yds.	11,926,100	19,396,900
Worsted yarn .....lbs.	9,500	390,300
Woolen tissues .....yds.	670,300	2,281,300
Worsted tissues and stuffs .....yds.	2,266,300	10,063,800
Carpets and rugs ...sq. yds.	32,300	135,100
Spun silk yarn .....lbs.	174,300	195,225
Silk broadstuffs, all silk yds.	65,882	88,688
Silk broadstuffs, mixed yds.	131,341	462,159
Jute yarn .....lbs.	85,400	764,500
Jute piece goods .....yds.	22,160,000	19,158,800
Linen yarn .....lbs.	659,600	788,800
Linen piece goods .....yds.	35,233,800	36,742,200

Some remarks in the "American Economist" on the failure of foreign manufacturers to adapt themselves to American requirements have received extensive publicity in this country. It is a commonplace to say that such adaptations never come suddenly. They grow out of the course of events and the changes occurring in the nature of the demand.

* * *

An advertisement stating that "An American mill making knitted cloakings, knitted astrakhans, knitted flannels, etc., desires an experienced salesman for the British Isles" has appeared in the London press above the name of a New York firm. The line is not one in which there is much British competition to encounter, for many years have passed since the Yorkshire firms making such goods threw out their knitting machines. The astrakhans made in this country are woven and although there is a small regular trade in piled goods of this type the larger demand is very fitful and it disappears for long periods together. High prices are paid for the limited quantity wanted for such purpose as trimmings for babies' coats. The knitted overcoat linings fashionable two or three years ago are seen no longer and fashion has turned against the knitted sports coat which has had a good run. Warm sleeved waistcoats for men seem to be gaining ground, but in a general sense the present time cannot be thought propitious for advancing knitted as against woven goods. The tide is running in the contrary direction.

* * *

Auxiliary appliances occupied more than half the stands at the second of the triennial textile machinery exhibitions held 27 March-15 April in Manchester. Ball-bearings, clutches, driving chains, patent stokers, motors, lubricants, fire extinguishers and the like were exhibited in profusion. As is perhaps inevitable in an exhibition held in only a moderately sized hall, the specifically textile displays belonged more to the order of incidental than of main machinery. There was a strong display of winding machines by the International Winding Co., Arundel & Co., Joseph Stubbs and others. A. G. Schweiter of Zurich and Franz Muller of Munchen-Gladbach both displayed winders in which the winding on and traversing of the yarn are effected by the motion of the spindle. William Tatham, Ltd., showed cotton waste opening machinery and their thread extractor for separating hard threads from loose waste. This last has toothed rollers for opening roller laps and sweepings, the threads wrap around the rollers between the teeth and are cut away later. The Smith system for spinning waste and short cotton direct from the condenser bobbin was shown at work upon a Derby doubler fitted with traversing feed and worker rollers with a condenser attached. The bobbins were taken direct to a ring frame and spun. Samples of cotton yarn up to 26° and of low woolen were shown. The claim is that in dispensing with the finisher card and mule, yarn is spun at half-cost. Asbestos has been dealt with under this system and progress has been towards the production of an asbestos yarn suitable for making incandescent mantles.

The well-known Barber warp-tying machine was on view and two German patents, a warp-leasing and a warp-twisting machine, were exhibited by Cook & Company. The two latter are similar in their arrangements for selecting the threads. In the twisting-in machine the ends of yarn are twisted together by rubbing between discs. The McColl yarn-clearer was on the same stand, together with the score of other specialties handled by this firm. Among the rest was a loom with Cook's bobbin-changing attachment. Ordinary looms were shown by W. Smith & Bros., and Hacking & Co. The last-named firm had six plain looms at work under one weaver, the filling in this case having been rewound into 2,000 yard lengths by the International Company. Atherton Bros. had a loom fitted with ball bearings to the crank and tappet shafts, an arrangement that is said to reduce the requisite driving-power by two-thirds. The smallware loom of the Patent Loom & Tape Company was the most novel piece of weaving mechanism. The pick is positive and the cradle carrying

the filling works over a slide. The reed is curved and the shed formed is of course a wide one.

* * *

Gun-cotton silk has fared badly in competition with viscose silk, which hitherto could be produced at a much lower cost. Viscose has been preferred, and almost exclusively used in the English dress goods trade, chiefly because of its strength and of its known behavior in piece dyeing and wet-finishing. Viscose has been the only artificial silk that the principal dyers would handle at their own risk. Important improvements in the nitrated product have been announced by its original inventor, Count Hilaire de Chardonnet, who guarantees a mathematical regularity of thread, a tensile strength equal to China silk and a cost price as low as viscose. The promise was made at the presentation to the Count of the Perkin Medal of the Society of Dyers and Colorists and improvements in spinning, twisting and denitrating are said to make the transformation possible. The yarn is to be delivered ready for the loom. The promise was made in the presence of H. G. Tetley, managing director of Courtaulds, Ltd., the concern principally affected by the improvement; and in that of G. F. Cross and Edward Bevan, the two chemists who created the viscose process.

* * *

The notion of making cloth to serve as an active heating agent and not simply as a holder of animal heat perhaps deserves wider consideration than it has received. A French engineer, C. Herrgott of Belfort, is said to have improved upon all earlier attempts in this direction. Nickel conductors are woven into his fabric and these are heated up by attachment to an electric lighting circuit. The invalid within the garment receives the comfort of warmth without risk to his own person. The available particulars are too scanty to enable an opinion to be formed and it is not certain that the problem can be better solved upon the loom than on the sewing machine. Lightness, flexibility, freedom from rust and safety are the advantages claimed for the Herrgott system over the asbestos and resistance coils that have been tried without satisfaction in the past. In France, at any rate, there appears to be some demand from the doctors for radiator-coats or suits and in time the goods may become as completely a part of the regular order as, for instance, surgical stockings.

* * *

One of the least regarded of textile by-products is the high grade of flake charcoal made from the shavings of thread spools and mill bobbins. The charcoal is valued as an insulating material for cold stores and for its high ignition point. The shavings are turned into retorts and distilled quickly at high temperatures and the gases are treated at one English bobbin works for the recovery of acetic acid and naphtha. On leaving the hot chamber the flakes are tossed in the air to cool and to absorb oxygen and in a very few minutes they are put into bags and two days later can be safely stored. The woodsheds and spool-making departments are large at the thread mills in Paisley, although mills in general have no large production of wood shavings. Bobbins and shuttles are bought ordinarily from their makers, but in one Lancashire weaving mill there is a 2,000-ton press for the purpose of compressing shuttle blanks to a sufficient density. Blanks come to the weaving shed to be pressed and are returned to the shuttle works to be shaped, hollowed and tipped.

* * *

It is a tradition in the trade that the practice of selling cloth by the 37-inch yard descends from time immemorial and that the extra inch was added by way of good measure. A Bradford court recently decided that 37-inch measure was a trade custom and one overriding the Weights and Measures Act. The court appeared not to know that the extra inch had legal sanction. Among the forgotten statutes of the realm is one of Edward VI, for the true making of woolen cloth, and the following is one of its provisions: "Nor . . . sell anye Clothe by any other lesse measure than after the true con-

tent thereof to be maten and measured by the yarde, adding to every yarde one ynche of the rule according to the Statute made in the sixt yers of the raign of Kinge Henrie theight, father unto our Sovereign Lord that now is." This gives the thirty-seventh inch a history of just 400 years, yet a month ago a lecturer at a "business science club" had the hardihood to include this measure amongst "false standards in trade"! The cotton trade has a measure known as "long stick" in which 36 1/2 inches go to the yard. Worsted dress goods sell in 36-inch measure. The 37-inch measure is, however, universal in the woolen trade, in which it originated, and from whence it has been transferred to the business in worsted cloth.

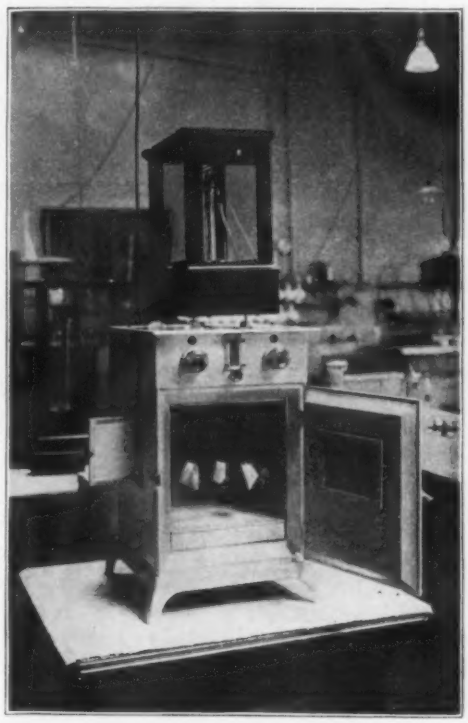
* * *

There have been published "The Letter Books of Joseph Holroyd (cloth-factor) and Sam Hill (clothier)" (F. King & Sons, Halifax, Eng. £2), being reprints of the business correspondence of 200 years ago. Letters of the period are exceedingly rare and the publication is one that should have interest in America. Chiefly the letters are to dealers in the Netherlands. One from Hill is to Abraham Van Broyes: ". . . I am sorry you will not make further tryall in Broad Shaloons, because I think I coud doe something bettr . . . provided I make constantly, but goeing from one Sort to another Spoils all the Weavers, as I have experienced all my Life in what Manufactories I have been concerned In." Hill served the hospitals with kerseys and made reds and blues for sailors. Job pieces were one of the troubles of his life and a letter conjures a customer "pray contrive it with convenience to order a few of these Rubish one way or other." Holroyd was a slyer dog whose market advices had not always the merit of consistency one with another. He traded in wool as well as in pieces and sold goods at a commission of 1 1/2 per cent. Wet weather used to interfere with deliveries: "I hope to send . . . tomorrow if a fair day, for there is 7 or 8 pieces on ye Tenters, wee have had much rain has hindred ye drying of yrn" runs one of these ancient apologies.

CONDITIONING TEXTILES AT THE CUSTOM HOUSE

By Our New York Correspondent

The New York custom house authorities have very recently purchased and placed in position a conditioning oven for conditioning cotton fabrics, also raw cotton and yarns in order to equalize the collection of duties. This became necessary on account of the new Underwood tariff establishing ad



THE FREAS ELECTRIC CONDITIONING OVEN

valorem rates on cotton yarn and cloth, and designating the various classifications according to the count or yarn number.

It is evident that the cotton yarn count will vary with the humidity of the air, consequently it became necessary to "condition" or to standardize the moisture carried in raw stock yarns and fabrics, thus insuring the collection of the same rate of duties in all seasons and under all conditions of humidity and temperature during the year.

The writer of this article called upon Dr.

Eugene R. Pickrell, government chemist in charge of the laboratory in the appraiser's office where the oven is located. Through the courtesy and consent of Appraiser F. A. Higgins the writer was permitted to inspect the oven and have a photograph taken of it, which is herewith submitted for the information of the readers of the Textile World Record. It is the first and only photograph taken of the oven up to the present time.

The oven is called the Freas electric conditioning oven and is one of only two in this country and probably in the world. The other is installed in the textile division of the Bureau of Standards at Washington.

The Freas oven is made with walls of asbestos, a non-conductor of heat, which are held in place by a metal frame. The size is 16 by 17 inches and 28 inches high. It is heated by an electric current resisted in its progress by a rheostat. An electrical fan is driven by the same current and causes a circulation of air through the chambers of the apparatus. Inside the oven are ten small metal baskets of exactly the same weight and numbered from one to ten. They are suspended from a circular chain which is made to revolve by using a small lever attached to the outside of the oven.

A very delicate balance scale is placed on top of the oven with a rod running down through the top of the oven. By using the lever outside, any one of the baskets can be brought under and hooked to the rod and weighed. The exact weight of a bone dry sample can be taken and recorded without opening the door or exposing the sample to the moisture of the outside air. A regain of 8 1/2 per cent. is added to the absolutely dry weight. The yarn number is then calculated and from this the rate of duty is determined.

In drying out cotton fabrics a temperature of 110° is maintained for about 30 to 40 minutes to get them entirely free from moisture. At present the oven is being used for treating cotton fabrics and yarns only, but when necessary it will also be used for conditioning woolens, silks and other fabrics. A fabric under ordinary conditions varies considerably in the weight under ordinary conditions of temperature and humidity, so that the yarn number if calculated from the commercial weight, would vary widely from time to time, causing corresponding variations in the duty. If the cloth is conditioned in the Freas machine, this cannot occur, and the same duty will always be collected on a fabric.

Another process for determining the conditioned weight of a fabric is to use a room with the temperature and humidity maintained at such a point that the actual weight will represent the standard regain for moisture, which is 8 1/2 per cent. for cotton.

A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

(This series of articles began in July, 1911.)

Translated and Revised by Samuel S. Dale

WEAVES FOR WOVEN BELTING

Woven belting consists of several separate textures, which are more closely interwoven than the ply fabrics just described. Certain threads alternate on face and back, making a through and through fabric. This results in a closer union of the different textures, and makes the whole fabric more solid and compact. In a double plain weave, Fig. 1489, threads 1 and 4 alternate on face and back; thread 2 being on the back and thread 3 on the face continuously. The first warp thread passes under the first pick to the back, and above the fourth pick to the face, thus forming a part of both face and back textures. The fourth warp thread, on the other hand, passes below the fifth pick to the back, and above the eighth pick to the face, likewise forming a part of both the face and back.

A similar weave is shown at Fig. 1490 and is used for cotton banding. It consists of two 3-leaf twills; 2 up 1 down for the face, 1 up 2 down for the back, making back and face alike. Warp threads 1 and 2 are face; 5 and 6, back threads. Threads 3 and 4 supply the place of a third thread for each twill, and pass alternately to face and back. Thread 3, for example, passes below picks 2 and 12 to the back, and above picks 5 and 7 to the face. Thread 4, on the other hand,

(Copyright, 1914, by Samuel S. Dale.)

passes above picks 1 and 11 to the face, and below picks 6 and 8 to the back. Following are several other weaves and lay-outs taken from practice:

(a) Double Banding, 4 3/4 inches wide. Weave, Fig. 1491. Warp, 6-ply No. 10 cotton. Filling, 8-ply No. 6 cotton, 410 ends in warp, 2 ends in each heddle, making 210 double ends. Four shafts, straight draft beginning with shaft 2. Reeded, first dent (at left) 3 ends, then 5 and 6 alternate, ending with 4 ends in last dent.

(b) Cotton Banding, 3 9/10 inches wide. Weave, Fig. 1492. Warp, 9-ply No. 16 cotton. Filling, 6-ply No. 10 cotton. Four hundred forty-two ends in warp. Six shafts, straight draft, beginning with shaft 3. Reeded, first dent (at left) 10 ends, then 15 ends in each of the next 28 dents, and 12 ends in last dent.

Certain kinds of double cloth, used for banding, belting, etc., are stitched by two threads introduced in the warp at intervals, each one alternately passing to the back and face so that when one passes to the face the other passes to the back, thus binding the two textures together. Figs. 1493, 1494, 1495 and 1496 show four methods of interlacing these threads with the filling. These extra threads must be woven from a separate beam, and dressed considerably longer than the ground warp on account of the greater take-up. Following are several practical examples:

FIG. 1491

FIGS. 1493 1494 1495 1496

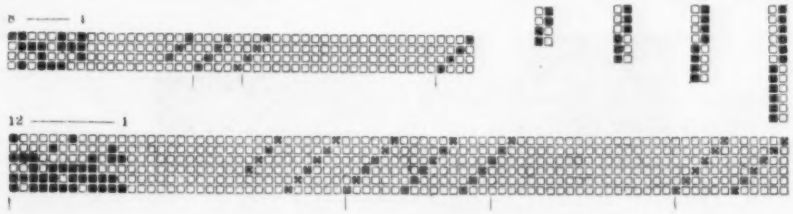


FIG. 1492

(c) 4-Ply Cotton Belting, 5 3/10 inches wide. Weave, Fig. 1497. Ground warp, 10 ply No. 16 cotton. Filling, 10-ply No. 6 cotton. Six hundred eighty-four ends in ground warp; 54 ends of binding warp. Eight ground and 2 stitching shafts. Reeded, first dent (at left) 8 ends, second dent 24 ends, then 26 ends in each of the following 27 dents, last dent 4 ends. Reed, 28 dents in 5 inches. The take-up of the ground warp is 22 per cent. Twenty-three yards of the binding warp is required for 10 yards of the ground warp.

FIG. 1497

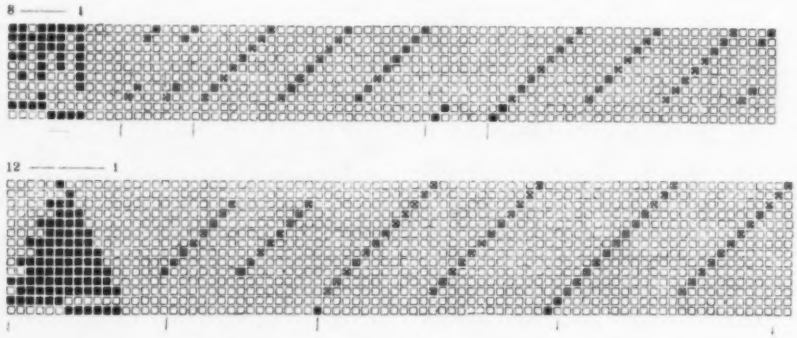


FIG. 1498

(d) 6-Ply Hemp Belting, 5 9/10 inches wide. Weave, Fig. 1498. Six hundred sixty-four ends. Three-ply No. 8 hemp yarn in

the ground warp; 53 ends double 3-ply No. 8 hemp yarn in binding warp. Twelve ground and 2 stitching shafts. Reeded, first dent 16 ground threads and 1 stitching thread, then 24 ground and 2 stitching threads in each of the next 26 dents, last dent 24 ground threads. Reed, 19 dents in 4 inches, 6 3/10 inches high. Take-up of ground warp, 22 per cent. From 25 to 26 yards of the binding warp is required for each 10 yards of the ground warp.

FIG. 1499

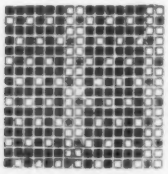


FIG. 1500

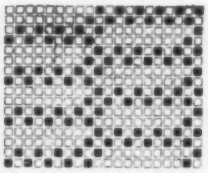


FIG. 1501

CORDS

These are corrugated effects, or raised stripes running in the direction of either warp or filling.

CORDED STRIPES

The warp cords are usually produced by letting one pick float on the back across from 4 to 16 ends, then raising it above one or two (seldom more than two) ends, while the next pick is interlaced with the warp with a plain, twill or other weave.

In ladies' corded dress goods it is customary to let two floating picks alternate with two binding picks.

The warp threads under which the floating picks pass, are pressed upward and form an arch as shown in the cross section, Fig. 1499. If a woolen cloth woven in this way is well fulled, the raised stripe is made more prominent, because the loose floating picks shrink rapidly, while the other picks, being woven more closely into the warp, full more slowly.

The weave at Fig. 1500 corresponds to the cross section at Fig. 1499. The raised stripe contains 6 ends, under which the floating picks lie, the latter being stitched plain with 2 warp threads. Fig. 1501 shows the same weave as used for ladies' dress goods, the risers being indicated by the white squares; the sinkers by the black squares.

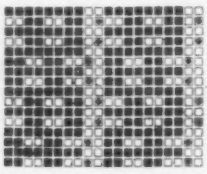


FIG. 1502

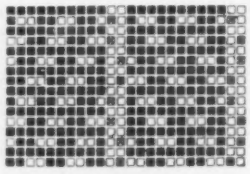


FIG. 1503

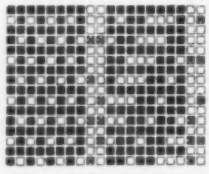


FIG. 1504

In Fig. 1502 the raised cord is formed with 8 threads woven with a 2 up 2 down basket, while 2 threads form the recess or depression between the cords.

Fig. 1503 shows 10 threads woven with a 2 up 2 down twill, alternating with 2 recess threads; the twill runs in two directions.

In Fig. 1504 the warp is arranged as follows: 8 threads woven plain, 2 recess threads, 8 threads woven with an 8-leaf diagonal, 2 recess threads; total, 20 threads.

If the face weave does not allow the weave for the recess threads to be drafted regularly, care must be taken to place the risers where they will break with the cord weave.

THE MANUFACTURE OF ELASTIC FABRICS

BY SAMUEL BROWN

(Continued from February.)

The corduroy weave is a distinctive effect. The rib on this web is very pronounced, and is usually made of a fine face warp which stands over two cords with one empty cord between each pair. It is made with a compensatory back warp with stock heavy enough to balance the face. Fig. 77 shows the harness draft. Fig. 78 is the chain draft, the construction of such a web being as follows:

Edge, 33 threads	2/60s
Binder, 56 threads	2/60s
Face, 112 threads	2/60s
Back, 80 threads	2/40s
Gut, 40 threads	2/40s
Rubber, 24 threads	38s
Reed, 17 dents.	
Filling	2/26s

1 1/8 inches wide.

FIG. 76 FIG. 78

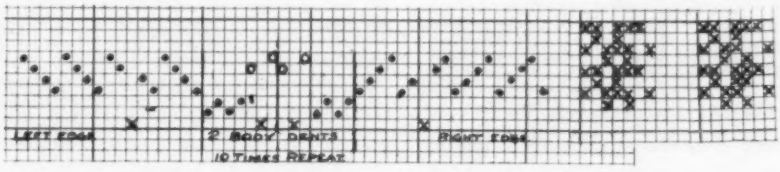


FIG. 75

The railroad weave is so named because indistinct lines resembling a railway appear in pairs at every two cords. These are produced by the harness draft repeating itself at these points. It is a single cloth weave, drawn in on 4 harness, 3 threads to the cord, as shown at Fig. 79. The chain draft is shown at Fig. 80.

The webs thus far described have been made on single shuttle looms. There are, however, several types of web which are made with two banks of shuttles, of which the "cross-shot" is one. The advantages of this operation are the increased output, the ability to work the rubber warp at a much higher average tension than is possible in single shuttle webs. In the construction of single shuttle webs the rubber harness rises and falls while making the shed for the passage of the shuttle. This creates a friction on the thread at the harness eye, and also an increased friction at the front reed. In the "cross shot" method the rubber remains stationary, with no upward and downward motion, and so can be stretched almost to its extreme limit while weaving, with little danger of chafing or breaking. Over and under the rubber are two distinct sheds, one making the upper and the other the lower cloth. These two fabrics are stitched by the binder, which passes up and down through them both.

In order to keep all the warp threads tight when shedding, it is necessary to run these under separate back rollers, fixed at different heights and centering the upper and lower sheds, so as to line with the back rolls and weaving line at the breastpiece. This is shown at Fig. 81, where the ribber warp is stretched in a straight line from warp beam to breast beam. The upper back roll, A, is used for the face and edge. The center roll, B, used for the binder and gut. The lower roll, C, is used for the back. The breast-piece rod is shown at D, towards

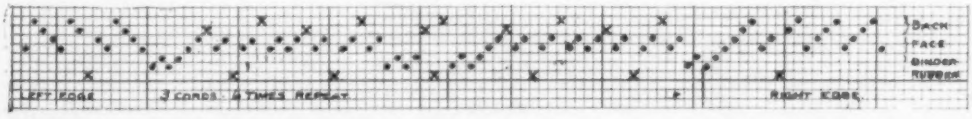


FIG. 77

which they all center; E, the shuttles passing through the two sheds.

The edge cloth, which covers the outside rubber threads, is drawn in the harness, outside the main body on the upper shed weave and while being woven, is pulled around the rubbers by the tension of the filling which is carried in the lower shuttle. This tension

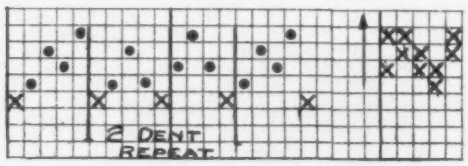


FIG. 79 FIG. 80

is greater than that on the upper filling for this purpose. The lower filling is at the same time connected to the upper filling by a pair of "tie" threads, which are drawn in at each side of the body of the web, they being a part of the binder warp and operated from the binder harness, but allowed to travel only through the lower shed as far as the center of the web. This is accomplished by the use of long looped eyes through which the threads are passed.

This type of web is generally made in a combined cam and jacquard loom, using the cam movement for the back, binder and edge and weaving the face from the jacquard. The cam movement is the same for all warps, being a one up and one down weave. The use of the jacquard for the face gives an opportunity for making a large variety of pattern effects. The binder movement which extends through the two sheds is usually made by a longer sweep from extra throw cams, or extended cam jacks; or a combination of both. The balancing of these goods may be regulated both by the warp and the filling, and any tendency towards curling, in the direction of the face or back can be corrected by changing the weight of the stock on either of these. The use of the upper and lower filling also enables different grades of stock to be in each shuttle. Colors to match the face warps may be used, while white may be retained in the lower shuttle for the back. Where it is desirable to introduce face filling effects, lustrous filling may be used in the upper shuttle without increasing the cost of the stock used for the back of the goods. This cannot be done in single shuttle work.

This style of weaving is particularly well adapted for making an all silk, or imitation silk rib filling effect, without the use of a face warp. The opportunity is here afforded for adding body to such goods by the introduction of a fine back warp and the use of cotton filling for the lower shuttle. It also results in a round edge, which stands wear much better than the wire edge usually found on single shuttle silk webs of this character. Moreover this method materially reduces the cost. It should be noted that in the construction of the lathe used for "cross-shot" webs, the formation of the upper and lower sheds, both pointing to one common center, makes it necessary to tip the bow of the upper bank of shuttles downward, and the lower bank upward, in order to reduce the friction of the shuttles all possible when they are passing through the sheds.

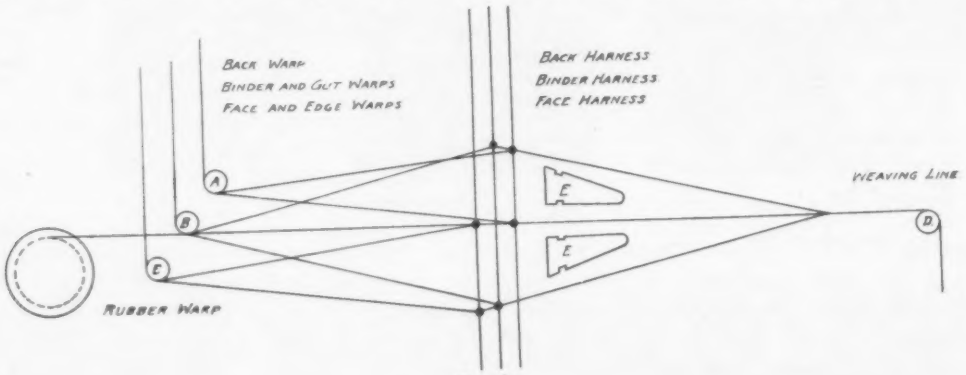


FIG. 81

(To be continued.)

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

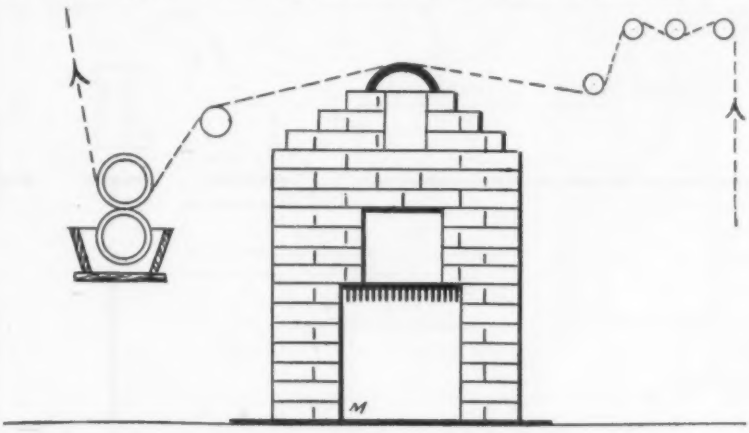
BLEACHING BEFORE DYEING

Editor Textile World Record:

Kindly advise us what character of machines are used by finishers for removing lint and other impurities from cotton piece goods, and for partially bleaching them preparatory to dyeing. Also give us a formula for making the bleaching solution, and a brief description of the bleaching process.

Essex (2228).

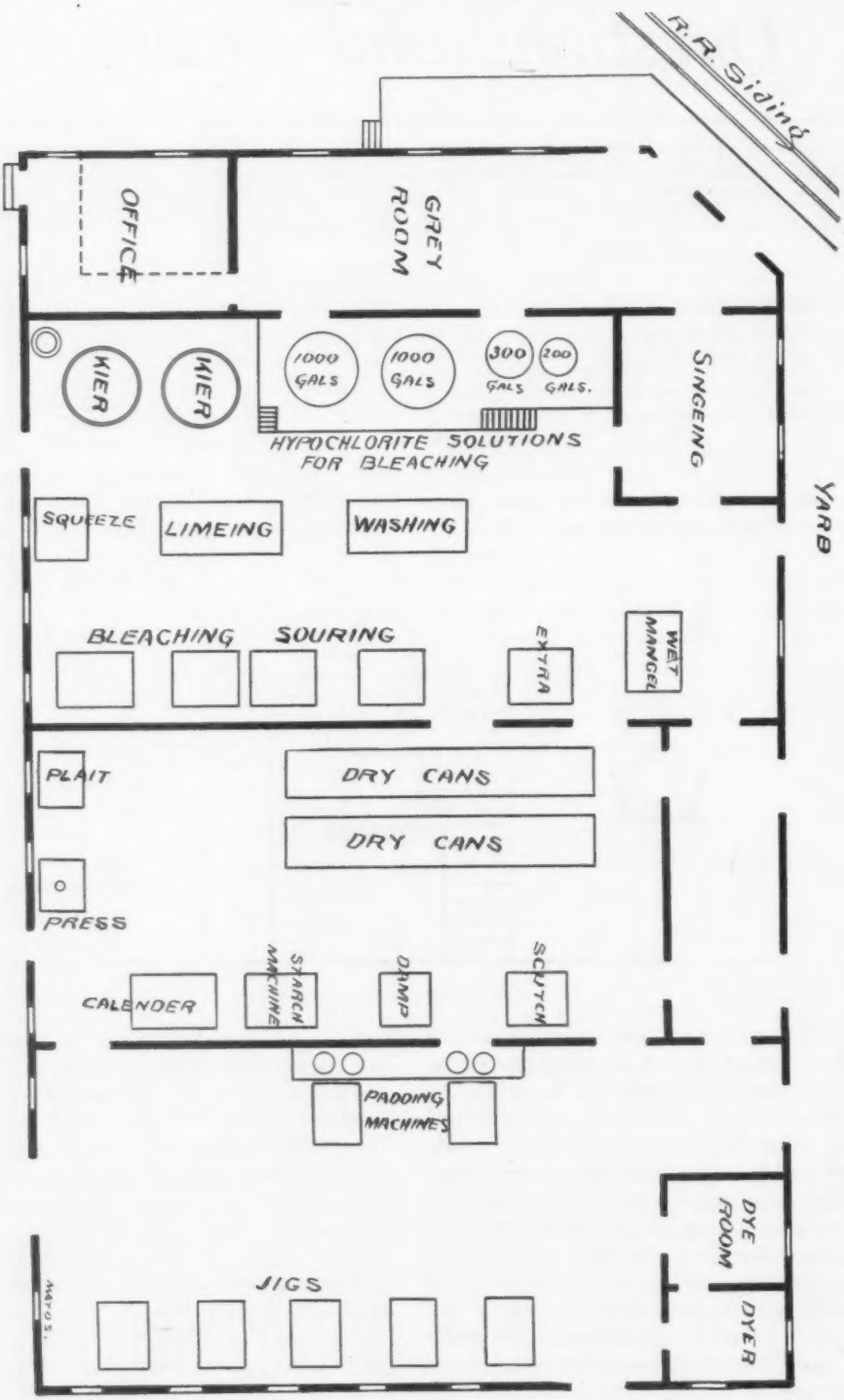
The machines that are used in cotton piece goods mills or finishing plants to effect the removal of the lint or fluff from the face of the cloth are known as singeing machines, and are generally constructed according to two main systems of heating, viz:—indirect heating, whereby the singeing is done by the pieces passing over a heated copper plate; the other is where the piece travels rapidly between gas flames, the singeing being accomplished by direct burning of the fluff. Where possible, the use of the gas singeing machines are to be recommended on account of the better regulation of the heating. Two illustrations are given which show at a glance the essential features of the two types of machines named. It is seen that with gas singers both sides of pieces can be singed in one run.



A SINGEING APPARATUS

After being singed the pieces are subjected to a boiling-out to remove all matter capable of removal by chemical means before the actual bleaching. This treatment is carried out by giving a lime boil in the kier, then a thorough plain boil, followed by a wash and sour to remove as much of the lime as possible, wash again to remove the remaining traces of acid and then give a good soda boil and afterwards wash well. The goods are passed into the chemick for the real bleach, remaining in it as long as may be necessary to produce as good a white as the grade of goods calls for. Afterwards give a sour to kill the chemick, wash and squeeze off and dry or pass to the dye house if the goods are to be dyed.

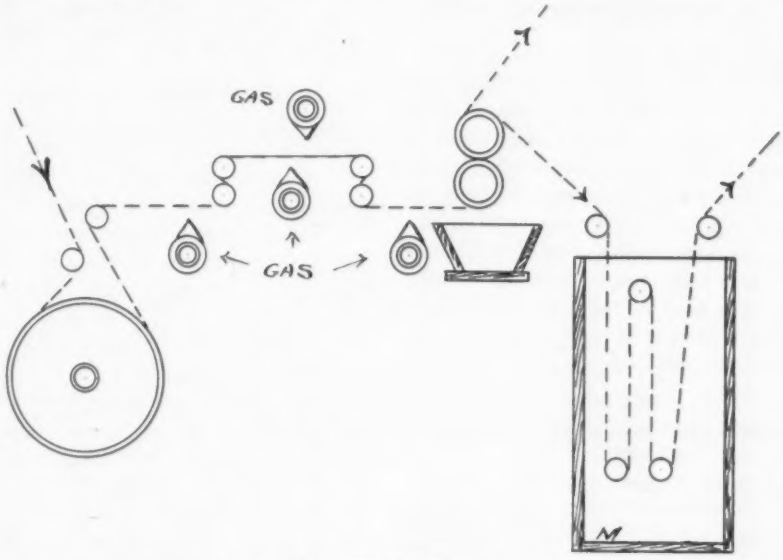
The so-called "chemick" is the most important part of the entire bleaching process, as in it the goods are either made or dam-



PLAN OF A SMALL PLANT FOR BLEACHING COTTON PIECE GOODS

aged. When cotton goods are damaged in the bleach or chemick, they are quite unsalable.

Bleach solutions are made according to various methods. The commonest process is to use bleaching powder, and make a liquor standing at 5° to 8° Tw. for the stock vat and let it down with water for the actual bleach to 1° to 2° Tw. Some bleacheries are using the bleach liquors made by decomposing bleaching powder solution with



A FOUR-BURNER GAS SINGEING MACHINE

a solution of soda ash, thus producing a solution of sodium hypochlorite of sodium which bleaches effectively without introducing into the goods traces of lime, which is always present if the ordinary bleaching powder process is used. Sodium hypochlorite is easy to handle and yields an excellent bleach adapted to the finer kinds of fabrics. The solution is prepared in the following manner on a large scale adapted to a moderate sized bleachery:

Four large tanks are required: 1 tank, 200 gallons; 1 tank, 300 gallons; and 2 tanks, 1,000 gallons each. Each of these tanks should be equipped with a simple mechanical stirrer that can be removed when not needed. There is also a supply of hot water. That supplied from an economizer is excellent. To prepare the bleach liquor: In the 200-gallon tank, run in 125 gallons of warm water, and dissolve in it 300 pounds of soda ash, stir, and when dissolved, add a further quantity of 65 gallons of water. In the 300-gallon tank run in 250 gallons of water and 500 pounds of high test bleaching powder and stir until all lumps have disappeared. Now run both of these solutions into one of the two large 1,000-gallon tanks and stir for a short time until the mixture is uniform, let settle over night, and in the morning the clear liquor is to be diluted to 6° Tw., when it is ready for use. It must be drawn from the tank without disturbing the heavy precipitate of carbonate of lime, which must be removed when the tank is emptied and before filling up again. For general use this strong bleach liquor is further diluted in the kiers to 3/4° up to 1 1/4° Tw.

Liquid chlorine is another form in which bleaching liquors can be made readily, but at present the cost of this process is somewhat too high for extensive bleaching on a large scale. The electrolytic production of hypochlorite bleach solutions is also gradually coming into use, and many knitting mills are using it.

The accompanying lay-out will give some

idea as to the essential equipment for a small piece-goods plant. Of course, it is very difficult to give the details for every part of such a plant unless the maximum out-put per month is known, and some idea is given as to the character of the goods to be handled, and whether the goods are to be dyed after bleaching. Some special shades must be produced on a bleached bottom.

Beta-Naphthol.

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BLEACHING KNIT GOODS

Editor Textile World Record:

If "Landum" will reduce the caustic by 2 per cent., make up with 3 per cent. of Soda Ash, add 1 1/2 per cent. of good castor oil soap, work the mixture 2 hours at 150° F., then bring to the boil and work 6 hours using a centrifugal pump for circulation and using bleaching liquor that has been treated with soda ash and sour off with muriatic acid, I am sure that he will get the yarn so that it will not have a harsh handle, but will feel much softer and fuller. Parma.

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CALCULATING THE DRAFT OF A DRAWING FRAME

Editor Textile World Record:

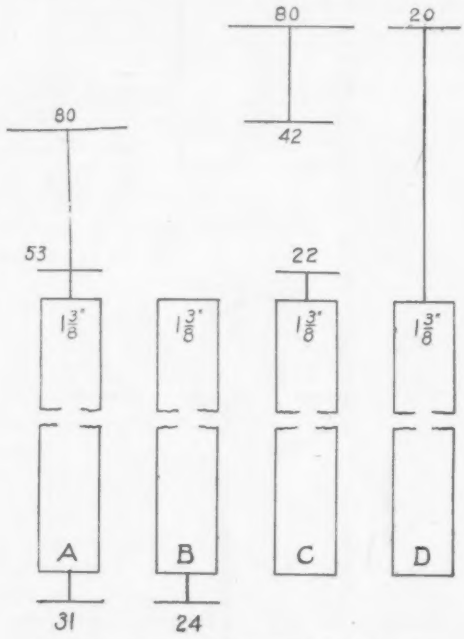
I enclose a sketch showing the arrangement of the rolls and gears on a Tweedale & Smalley cotton drawing machine and would like to have you calculate the draft between rolls A and B, B and C, C and D, and the total draft between rolls A and D. The sizes of the gears and rolls are marked on the sketch. Jasper (2291).

The draft between two sets of rolls depends upon the diameter of the rolls and the gears by which they are driven. The draft so far as it depends upon the size of the rolls is calculated by dividing either the diameter or the circumference of the drawing roll by the diameter or circumference, as the case may be, of the delivery roller. For example, if the diameter of the delivery roll is 2 inches and of the drawing roll 3 inches, the draft of the rolls when running at the same number of revolutions per minute will be $3 \div 2 = 1\ 1/2$. In the example submitted the rolls are all of one size so that they can be eliminated from the calculation.

The draft between two sets of rolls so far as it depends on the size of the gears connecting them is calculated by dividing the number of teeth in the first gear by the number in the gear that follows it. This, it should be noted, is the reverse of the calculation in the case of the diameter of the rolls.

The gears connecting rolls A and B have 31 teeth on the delivery roll and 24 teeth on the drawing roll, consequently the draft between these rolls is $31 \div 24 = 1.29$.

The gears connecting rolls D and C have



SKETCH SHOWING THE ARRANGEMENT OF ROLLS AND GEARS

24, 31, 53 and 22 teeth respectively. In this case the gears with 24 and 31 teeth respectively occupy the reverse position from that in the calculation for the draft between A and B. In this case 24 is divided by 31. The gear with 53 teeth is divided by the gear with 22 teeth, making the formula read as follows:

$(53 \times 24) \div (31 \times 22) = 1.87$ draft between rolls B and C. The draft between rolls C and D depends on the gears with 22, 53, 80, 42, 80 and 20 teeth respectively. For the reasons already explained in the preceding calculations this draft is determined by the following formula:

$(80 \times 80 \times 22) \div (20 \times 42 \times 53) = 3.16$, draft between rolls C and D.

The draft between the first delivery roll A and the last drawing roll D depends on the gears having 80, 42, 80 and 22 teeth respectively. For the reasons already explained this total draft of the machine is calculated by the following formula:

$(80 \times 80) \div (20 \times 42) = 7.62$, total draft of the machine.

The total draft of the machine is equal to the product of the separate drafts:

$1.29 \times 1.87 \times 3.16 = 7.62$, total draft of the machine.

In calculating the draft from the gears it should be borne in mind that the gear on or nearest to the delivery roll is divided by the gear following it. This operation is performed successively for each independent pair of gears, omitting intermediates, regardless of which is the driver and which is the driven gear. For example, in calculating the draft between rolls A and B, 31 was divided by 24 because 31 is the gear on the delivery roll and 24 is the gear on the drawing roll. In calculating the draft between C and D, 80 was divided by 20 because 80 was the gear nearest to the delivery roll while 20 was the gear on the drawing roll. In the first case, however, the driver, 31, was divided by the driven gear, 24, while in the second case the driven gear, 80, was divided by the driver, 20. We mention this in order to point out that the position of two gears in the formula depends not upon whether they are drivers or driven gears, but upon their position as related to the delivery rolls and the drawing roll between which the draft is to be calculated.

DETERMINING THE GAUGE OF A KNIT FABRIC

Editor Textile World Record:

Can you inform me of any method known by which one can distinguish the cut of a machine or the number of needles to the inch by inspecting the fabric, that is, in latch needle work? I am sending a sample of goods recently made on a 11-cut machine, 36 gauge needles with a 42 hook and have been told by several it was made on a 12-cut machine. Moscow (2308).

There is no known method, except experience, that I ever heard of, by which one can tell the cut of needles from a sample. The sample submitted looks to me like a 12 cut. There might be a difference between the 11 cut and the other frames in number of needles. In fact some 11 cut machines I know of come nearer being a 12 cut, owing to the variation in the standards of machine builders. Trenton.

THE ORIGIN OF THE DENIER SYSTEM

Editor Textile World Record:

Please inform me what the denier system of numbering silk is and how it originated.

Netcong (2305).

Our French correspondent replies to this question as follows:

The object of testing silk is to determine the size and the regularity of the thread. According to Rondeau, the first test of this kind was made at Turin in 1775 and it was only at the end of the 18th century that these tests were adopted at Lyon. Up to 1858 silk was tested for size by private firms, the silk used for the tests remaining the property of the firm in question. On June 25, 1856, a law was passed authorizing the conditioning house, which had been founded in 1805, to make tests of the size of silk. At first these tests were made with 80 ends, each 120 aunes in length, a total of 9,600 aunes. This quantity of yarn was weighed in deniers, the number of deniers indicating the count of the silk. An engineer at Turin built a reel for measuring 400 aunes, which quantity was weighed in grains. As a grain is 1/24 of a denier and 400 deniers is 1/24 of 9,600 aunes, the new method of reeling and weighing gave the same results as the old one, the number of grains per 400 aunes being equal to the number of deniern per 9,600 aunes. While the trade accepted the new method of reeling it retained the word "denier" to indicate the count of the silk, a custom that prevails at the present time, the number of deniers indicating the grain (.0531) weight of 400 aunes of 476 meters.

Various international yarn congresses have studied this question of numbering silk and have retained the method by which the count indicates the weight of a fixed length, the number of the yarn being defined

as the weight in grams of 10,000 meters. It was agreed that the count should be determined by measuring 20 skeins of 500 meters each and weighing them separately in milligrams. A comparison of the weight of the 20 skeins enabled the regularity of the yarn to be determined, the total weight in grams indicating the count.

In spite of the advantages of this method the denier system has been retained alongside of the new count, both of which are marked on the certificates of official tests for size:

Ordinary count, grams per 500 meters.

Old count, deniers (.0537) per 476 meters.

The silk trade also uses a third system which is a mixture of the two given above:

New size, deniers per (.053) gram per 500 meters.

The counts in grams and in deniers as given on the official bulletins of tests can be reduced by the following simple formulas: T, representing the decimal number; and $TT = T' \times .0536$.

$T' = T \times 17.962$.

In addition to the size of the yarn the testing house indicates the number of breakages which has occurred in the 5 skeins during a reeling period of two hours. Gaul.

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KNITTING LARGE FIGURES ON JERSEY CLOTH

Editor Textile World Record:

Can you give me any information regarding knitting machines for jersey or bathing suit cloth on which letters and figures can be knit into the goods? Knitter (2309).

A flat fabric could be knit on a jacquard machine but this would leave floating threads on the inside of the garment which is impractical where such large figures or large letters are used. The old fashioned English hand knitting frame would produce such articles but this process is very slow and furthermore it is extremely difficult to secure help to operate these machines. The younger generation never became expert on these old hand frames and the old men who still work on them are gradually dying off. It would seem as if the most practical solution would be to stitch on felt letters which have been previously cut or stamped out or you might be able to secure a few good hand finishers who would be able to use the stocking darning stitch for plaiting a colored letter on the top of the regular jersey garment. This could probably be done at a cost of about 25 cents a letter in sizes up to four or five inches high.

Max Nydegger.

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WEIGHT LOST IN MERCERIZING

Editor Textile World Record:

The answer which "Wessex" makes in your April number to the correspondent who inquires regarding the loss in weight incurred in mercerizing, indicates that he does not comprehend the subject.

The average loss in weight which occurs in mercerizing is 5 per cent. When the yarn is of inferior quality, carded stock, a loss of 7 per cent. is likely to occur.

"Wessex" says mercerized yarn contains 5 per cent. more moisture than natural cotton. There is a slight degree of merit in this statement, but your correspondent would be improperly informed if he were left to assume that this additional percentage of moisture occurred in a natural manner. The truth of the matter is that when mercerized yarn contains more than the normal amount of moisture, i. e., 8 per cent. (the normal amount of moisture in cotton yarn, plain and mercerized, is 8 per cent.) it simply indicates that everything over and above 8 per cent. has been introduced by a conditioning process in an endeavor to offset the loss of actual weight incurred in the mercerizing process. If the mercerized yarn was returned without conditioning, if it only contained a proper amount of moisture, i. e., 8 per cent., it would be approximately 5 per cent. lighter than it was in the natural state. Irrespective of the process or processor employed, yarn must lose weight in mercerizing and if mercerized yarn is returned up to weight, it simply means that it contains 12 per cent. or 13 per cent. of moisture instead of the customary and normal 8 per cent. Any processor will return yarn up to weight if he is so directed.

Lack of frankness and fairness on the part of some processors and lack of precision on the part of some writers have resulted in

confusing the consuming trade as regards processing losses. We are quite sure that your cooperation in establishing the facts of the case would be appreciated by reliable processors and the trade generally.

Yours very truly,

General Processing Co.,
J. J. Cabrey, Mgr.

SIZES OF KNITTED LEGGINGS

Editor Textile World Record:

Please send us the scale by which knitted caps and leggings are measured, also the sizes of yarns used in their manufacture. Manufacturer (2306).

Leggings are marked 1, 2 and 3. Each size should be one inch wider and one inch longer in the waist and one inch longer in the leg. The legging illustrated in the February issue was size 1. The yarn used for manufacturing these leggings is 3/20s and 2/15s worsted.

The size generally used for hockey caps is fourteen inches, that is to say the body of the cap is ten inches long with a four-inch roll. The size of these caps are regulated somewhat by the size of machine and yarn used. Delmar.

THE STANDARD FOR OIL IN TOPS

Editor Textile World Record:

Referring to the article on conditioning worsted tops and yarn in your February issue, you state the regain allowed by the Bradford Conditioning House is 18 1/4 per cent. Can you let us know what is the standard allowance for oil or dirt in English tops? We have bought English tops and had them go through the conditioning house. The moisture was quite satisfactory, but we found an excess of loss in the spinning amounting in some cases to as high as 6 per cent. as a result of oil and dirt. (2314.)

Our English representative replies as follows:

Bradford tops are not supposed to contain any dirt and no specific allowance is made for such impurity. Tops sent to the Conditioning House can be tested at low charges for oil as well as for water. The usual course is to submit them to the commercial scour test, which is performed in the following manner:

Small portions of top are taken from each bag to form a one-pound sample. This is divided into two 8-ounce samples, which are thoroughly dried in conditioning ovens and transferred to the scouring department. Each sample is scoured in water at 120° to 130° F. with neutral soap in three baths, or in more should the sample not appear sufficiently clean. The samples are then redried and the difference between the absolutely dry weights is taken as the loss in fatty matters, etc. The proportionate loss is calculated by adjusting the original weight to the officially correct condition. The samples are treated separately, one result is checked against the other and in the event of a material discrepancy further tests are made for verification. There are standards for scour loss. A loss of 3 1/2 per cent. is allowable in the case of oil-combed tops; or 0.634 per cent. in dry-combed tops. It would thus appear that "Perth" might have saved, or gained, about 2 1/2 per cent. by insisting upon a test that would cost him 84 cents to make, as against 28 cents for a moisture test alone.

The test described is the regular one, but another can be performed at an extra fee of 48 cents to distinguish between loss from oil and loss from dirt and thus to arrive at the net weight of fatty matter. A portion of the top is treated with ether to dissolve out the oil and the result is read in conjunction with the gross loss in the commercial scour test.

James Strand.

HORSE-POWER REQUIRED FOR A WOOLEN MILL

Editor Textile World Record:

Have you any record of the horse-power required for say a six-set woolen mill. There is such a difference of opinion that I would like to know as near as possible the correct horse-power needed per set of say 48-inch cards, with looms, mules and finishing machinery to correspond.

Power (2271).

Our English correspondent replies as follows:

The particulars are insufficient for furnishing a definite reply, but some material can be supplied which may assist calculation. John Haigh & Sons, Ltd., Huddersfield, estimate that about 1 1/4 h. p. per part is required to drive their 60-inch woolen cards and for narrower cards the power should be a trifle less. By one part is meant a cylinder with angle, 4 strippers, 4 workers, 1 fancy and a doffer. Six sets of machines with hop-

per feeds and scribblers, breast and two cylinders (66 inches wide), with Scotch feeds to carders, which are fitted with two cylinders and single stripper condensers (60 inches wide), together with six 400-spindle mules, are all driven from a 60 h. p. motor.

The question asked by "Power" is one that permits of many answers, all different, and all correct. In order to reply intelligently, it would be necessary to have data as to goods to be manufactured, as fabrics of different types will require varying amounts of power. It is necessary in some mills to provide power enough to allow of operating fulling mills on extremely heavy fabrics, which in instances within the writer's experience, have required 30 h. p. for a double mill. To arrive at a fair basis for the calculation, the ordinary heavy weight cassimere will be taken as the fabric to be manufactured. The stock is 60 per cent. medium wool and 40 per cent. all wool shoddy, which will not require excessive fulling. The mill should have machinery as follows:

	horse power
1 30-inch burr picker	6
1 30-inch mixing picker	4
6 sets 48 by 48 cards	24
6 360 spindle mules	18
1 dresser	2
36 92-inch looms	27
1 4-string washer	3
2 fulling mills	16
1 extractor finishing room	10
1 extractor dye house	10
1 dryer	6
1 gig	3
1 brush	2
1 shear	2
1 press	5
Total horse power	138

From the foregoing figures it appears that the horse power required would be at least 138 without the shafting load, but the fact that a portion of the machinery will not be in operation at all times must be considered. It is not likely that both extractors or both pickers would be used at the same time, or for more than 50 per cent. of the time, nor would the fulling mills be in constant use. For some time during the morning the washer would be idle. No power has been allotted the card grinder, as in all probability a set of cards would be idle while this was in use. With allowances made for part time machinery, the power required may be safely estimated at 120 h. p. for the machinery and 20 per cent. additional for shafting load, a total of 144 h. p. for a six-set mill with the equipment given above.

The figures given may appear to some much higher than the actual requirements of the case, but most of the data are for actual results in the mill, as shown by indicator cards taken as tests by a consulting engineer in determining the feasibility of substituting electric power for steam during the night shift.

The actual power required to operate a six-set mill manufacturing ten-ounce goods from A super wool, spun to five run warp and five and a quarter filling, would be materially less than for the heavier fabrics. The writer had charge of such a mill for some years and found a 75 h. p. engine amply able to carry the full load. The lighting plant was operated by an independent engine of 15 h. p. Roan.

CURLY PILED CLOAKINGS

Editor Textile World Record:

I enclose a sample of cotton warp cloaking showing a peculiar wavy effect. The undulating streaks of light and shade run filling ways. I would like to know how this effect is being produced. Is it caused by the irregular length of the nap, or produced in finishing? A friend has the idea that the wavy effect is obtained by gigging the piece and then winding it with a cotton apron on a crab roller. Dick Rowe (2318).

We have received this question and similar samples from a large number of manufacturers in different parts of the United States and Canada. Our French correspondent to whom the question was referred replies as follows:

The sample presents nothing out of the ordinary. It is a napped fabric and the wavy effect is produced by running the goods between calender rolls, one of which is engraved so that the nap is pressed harder in some places than in others to produce the effect desired. This wavy effect disappears very quickly and the process is used only for very cheap goods. Gaul.

Knitting Department

THE KNIT GOODS SITUATION

Up to the present time the retail trade of the country have bought only 60 to 65 per cent. of the fall underwear that they usually have purchased at this time of the year. Orders have been placed by the majority of the retailers, but they have been very much smaller in almost every instance and it now looks as if the buying season will be extended well into the summer months. Jobbers are continuing to send out special men in the hopes of getting a normal amount of business on their books by July first.

One item in particular on which there has been a falling off on business placed is women's twenty-five cent ribbed vests and pants the reason given for this is that the garments produced today at this price are little more than rags. Manufacturers formerly made a line of 25-cent underwear when cotton was low enough so as to enable them to furnish an 8-pound garment to sell at 25 cents. Now that the price must remain the same to meet the views of those who contend that popular prices must prevail, the weight has been so reduced that the goods delivered at the present time run from 5 1/2 to 6 pounds and can scarcely be called winter garments.

Some manufacturers have been hampered to quite an extent by the requests of jobbers for the holding up of their spring purchases. The reason given for this is that the merchandise managers in the large retail stores have been ordering deliveries held up, until the weather conditions were more favorable. This plan of buying and holding up the purchases has developed a very unsatisfactory condition of affairs and as a result of it some jobbers have adopted the plan of billing up the merchandise on the date given for delivery, regardless of any changes that might be made afterward.

Some manufacturers state they have about 75 per cent. of their production sold on fall weights and are not worrying much about the balance, as many jobbers have so far bought quite sparingly. It is felt that they must come into the market for merchandise before long. It is also reported, however, that some of the larger Western jobbers who did place fairly good orders early have recently asked to have portions of their orders cancelled.

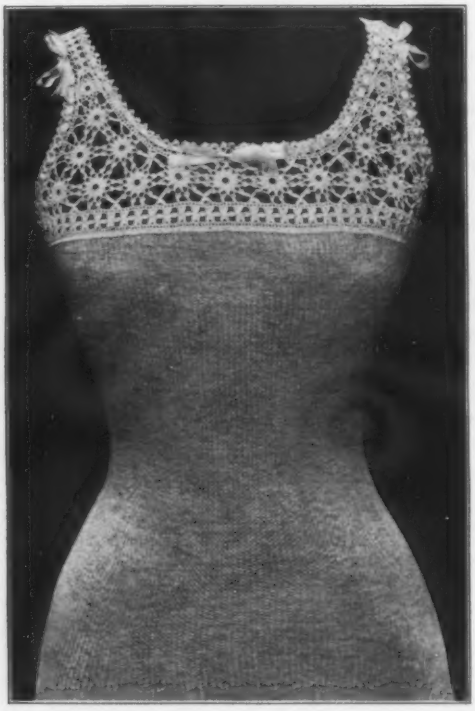
In some quarters it is stated that, although buyers and merchants when pressed for particulars have formed the habit of saying that "business is away off," it has been found that sales put on the books since the first of January are up to, and in many cases ahead of last year. Retail buyers did not place the usual early orders for spring goods during September, October and November. Up to the first of the year, jobbers had less orders on their books than in previous seasons, but since the beginning of the year, business on all lines of light weights has come along very freely, and it is believed that the aggregate spring business has been fully up to last year. The question arises now whether the fall business will not turn out in much the same manner when the season opens up and the consumer needs merchandise.

There has been no recession in prices during the past month or two and it is believed that there can be none, as prices now on fall lines represent rock bottom. The mills which cannot get business at present quotations, must either shut down or work at a loss.

All indications point to a good demand for light weights, as consumers have bought more spring and summer goods during the past winter than ever before. This has had the effect of cleaning up retailers' stocks in an unusual manner.

There seems to be an impression by many interested factors that the underwear business is going through the same change as the hosiery end and that in the future only medium and light weight fabrics will be used for knit underwear generally.

If there is any more activity in fall weights than another during the past month, it has been in combination suits for men and women to retail at one dollar. Women's suits made of unbrushed ribbed fabric, running from 8 to 8 1/2 pounds per dozen are in excellent demand for fall delivery. These are being taken largely with dutch neck, 11 inch sleeve, although good quantities are being sold made with high neck, long sleeve. A



A NEW GERMAN PATTERN

few are being taken in low neck, sleeveless styles.

The Royal Gem Mills Company have brought out a line of 8-pound suits at $3.75 on which they are running a considerable portion of their plant.

The LaTosca Knitting Co. are offering a line of suits, running about 8 pounds to the dozen made on latch needle machines at $6.00 per dozen. The Roulette Co. of Hagerstown, Md., are offering a line made on Cooper's spring needle machines, the same weight and of high grade yarn at $6.75. These are finding a very ready sale.

The Campbell Knitting Mill Co. have a 9-pound garment at $7.00 made in the various shapes on which they have booked a good fall business.

The change in the tariff has not had the effect as yet of increasing the importation of underwear to any great extent. A fairly good volume of business continues to be placed on lisle thread vests made in Germany. These are being taken mostly in low neck, sleeveless styles finished with hand crocheted yokes and brought out to retail at 50 cents to $1.50.

We illustrate in this issue a new pattern just received from one of the most important German manufacturers. These are in grades that retail at $1.25 to $1.50 each.

Agents and manufacturers are beginning to talk about the opening of spring, 1915, lines. While there are many interested factors who state that the opening should be delayed to the middle or latter part of June, it is probable that the same parties will be on the road with their new samples by the time this issue is in the hands of the readers.

HOSIERY

A quiet period in the hosiery market is usually looked for during the months of February and March, but this year that period has extended well into April and the sluggish condition is being felt quite seriously by retailers and jobbers. Some attempt to explain this by saying that the consumers are not buying supplies as generously as usual and that, on account of this retrenchment, retailers are not placing the usual orders with the jobbers. The hosiery business generally is on a hand to mouth basis.

There is no let up in the growing popularity of 25-cent artificial silk stockings for women. Some manufacturers who have been making lisles and mercerized goods have been obliged to put in artificial silks to keep their plants going. The all fiber boot to sell at 25 cents is sold largely and there are now four or five makers who have a line of this class of goods to show, although

some of them give the buyers to understand that they must assume the responsibility as to the lasting qualities of this merchandise.

The new tariff laws have not yet affected the hosiery business of the country to any very great extent, but there are those who look for a big increase in the importation of German hosiery before the end of the present year. It has been reported from Chemnitz that some good sized orders have already been placed and it is certain that the Philadelphia manufacturers who make fashioned hosiery are not as far behind on their orders as they have been.

Among the smart things for men are black half hose with white clocking, and white with black clocking, also pearl gray with red. Black and white clocking are selling freely.

Both English and American manufacturers have recently put on the market half hose embodying features that make unnecessary the use of garters. A Philadelphia maker has brought out a sock with a so-called French top that makes the garter unnecessary. A London manufacturer has also brought out one with a ribbed portion running down the back of the leg as far as the heel, and for which the same advantage is claimed.

The Department of Foreign and Domestic Commerce imported some samples of Japanese made hosiery and exhibited them in New York and Philadelphia. After an inspection of same by domestic manufacturers, it was stated there need be no fear of competition from that source. The Americans have the right of way when it comes to making silk hosiery and in fact a large quantity of this class of goods are now being exported.

Some of the new ideas shown in domestic hosiery to retail at $1.00 are colored tops with the same colored boots. Such combinatins are gold with red, lavender with Kelly Green, and red with emerald being particularly good. Black with colored boots and colored tops with black are also taken freely.

In the higher priced silks, jet and metal ornaments in heavy and elaborate designs are being sold well, as are also those with beaded anklets on one stocking only to use with slit skirts.

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THE SCOTT & WILLIAMS SYSTEM OF HOSIERY KNITTING MACHINES

Centuries ago, when knitted stockings were first made for men in half lengths, or half hose as they are now called, they were undoubtedly made without a ribbed upper portion, now known as the ribbed top, and it is probable that at that time were perfectly satisfactory so long as they were properly hemmed or finished at the upper edge. This was no doubt accomplished by laborious and tedious hand operation.

If such a stocking made of plain fabric is not hemmed or welted it has a decided tendency to curl upon itself and become distorted. On the other hand, a ribbed fabric does not have this tendency of curling upon itself, and it naturally occurred to the early hosiery makers to unite a section of ribbed fabric to the top of the half hose to prevent this curl and to form a finish. It has long been known that no special utility attaches to the presence of this rib top, but until recently no satisfactory way was found to make a half hose without resort to this strip of ribbed fabric. If at any time, within the history of the industry, it had been possible to knit cheaply a hem upon the top of a half hose it is certain that this would have served every purpose.

Whether we consider a half hose made in the ancient way, upon a flat row of needles, or in the modern way, upon a circular series of needles, the attaching of this ribbed strip or ribbed top is always a difficult and laborious operation and adds materially to the cost.

Within the last two years Scott & Williams, Inc., 88 Pearl St., Boston, Mass., the well known builders of knitting machinery, have placed upon the market a complete system of machines, the chief characteristic thereof being the ability to automatically knit a half hose or ladies' stocking in tubular form, having an integrally turned welt at the top thereof, which effectually prevents the

over-curling of the fabric, so that by the use of machines included in this system it is possible to knit both women's hose and men's half hose on a circular series of needles entirely of plain fabric having integral knit welts and top portions of such a character as to simulate the old ribbed tops in appearance, but from the view point of utility and wear they present an improvement over the old style hosiery which has been recognized by the trade in this and other countries, proven by the increasing demand for machines of this class.

Scott & Williams, Inc., build this system of machines in various styles, which are designated by letters. Thus, their Model F machine might be said to be the machine of the highest order, capable of knitting in any gauge from the coarsest to the finest. It produces women's hose with a deep knitted welt or with knitted welt and cuff top, taking the place of the old style ribbed top hosiery for women; half hose with the deep French welt and a narrow and sightly top; and, in ladies' hose, will introduce an anti-raveling course at any point desired, so that no raveling can take place from garter tears or other causes. This Model F machine performs all its functions automatically and drops the stocking from the machine finished, except for the closing of the toe.

Other types of machines are designated Model O-5, Model O-3; Model Q-5; Model Q-3; Model B-5; Model B-3 and Model M. In each case the letter denotes the models and the numeral the number of yarn changing levers employed in the particular model referred to.

In connection with these machines, Scott & Williams, Inc., have adopted a very comprehensive plan whereby any purchaser of machines may insure himself for the future against the possibility of a higher form of machine being required. This means to say that Model B-5, for instance, is designed to make ladies' hose or men's half hose in the ordinary old style way by the transfer of a ribbed top, in the case of the half hose, or the sewing of the welt or hem, in the case of the ladies' hose. This machine can subsequently be changed to either a Model O or Model F machine, when desired, upon the payment of the difference in list price of the respective machines, plus $10.00 for the necessary work of altering and starting up the machines in the factory. This additional payment, therefore, need not be made until the necessity for the use of a higher type of machine arises, and inasmuch as the system is covered by product and process, as well as mechanical patents, Scott & Williams, Inc., will agree to grant a free license to the purchaser of a low order of machine to make the products and practice the processes involved in the operation of the higher form of machine, if and when the change from one model to another is made. Of course this agreement to change machines involves the maintenance of size and gauge as they existed in the original machine.

It is thought this broad policy upon the part of this Company will be appreciated by manufacturers who do not wish to mix their product and can in some cases take advantage of these labor saving machines only on new lines.

These machines, as is now well known, are of the revolving cylinder type and have a multiplicity of yarn changing fingers so that stockings of the most modern kind can be made thereon at the least possible cost, and facilities for splicing, reinforcing, plating, etc., are present in all forms of the machines of the system except Model M. This machine is an up-to-date knitting machine reduced to its lowest terms, so to speak, and involves but two yarn changes; an illustration of its use can be made by referring to a half hose of the ordinary kind where the body is made of one yarn and the heel and toe of another. This machine, together with the Model B-5 and Model B-3, is fitted with automatic transfer mechanism, that is, in the sense that the machine is automatically prepared for the reception of the transfer cup and after the girl has placed the same upon the needles she is simply obliged to start the machine, and while this effects quite a saving in the cost of making old style half hose, it does not, of course, compare with the great advantages effected by the use of the Model F machine.

These machines are built in the finest possible gauges, down to the coarsest, and in

Models down to Model B-3, in size from 3 1/2 to 4 inch. Model M may be had in sizes down to 2 inch. Models O and Q both start knitting women's stockings on the naked needles from a perfect selvage, Model O in addition thereto forming an anti-raveling course.

Many special points of advantage are present in these machines,—for instance, where an extra yarn is introduced in the splicing or reinforcing heel or toe, or the sole, a very simple arrangement causes local slackening in those wales only of the stocking in which the extra thread is introduced.

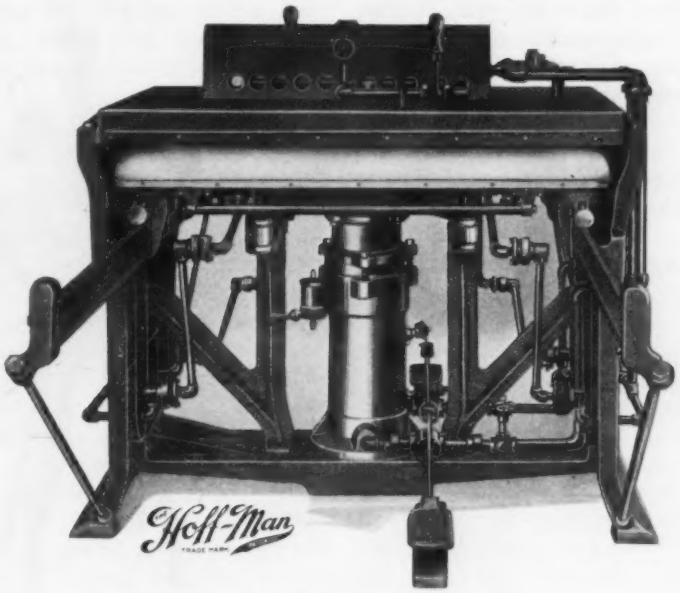
The cylinders of these machines are made as Scott & Williams, Inc., have always made their knitting machine cylinders, that is to say, each groove is protected by a high grade sheet steel hardened insert, thus making the cylinder indestructible, as the renewal and removal of parts can be readily made.

It will be recognized at a glance that the half hose as made upon the Model F machine materially reduces the liability of menders, and entirely saves the rib top waste. Moreover, the production is not dependent upon skilled operatives, and the machines can be operated day and night. For instance, a plant is now at work under these conditions which produces 15 dozens per machine to a run of twenty hours.

These machines can be seen in operation at the general office of the company, 88 Pearl St., Boston, or at the New York office of the company, 366 Broadway, and a complete exhibition at the convention to be held in Philadelphia in May.

THE NEW HOFF-MAN PRESS FOR HOSIERY

Underwear and sweater manufacturers are aware of the success attained by the Hoff-Man FFF underwear press, which introduced a new principle for pressing knit goods. The United States Hoffman Co., of Syracuse, N. Y., has within the past few months introduced a machine based on similar principles but designed particularly for hosiery manufacturers. This press, which is known as the "L Model," is shown in the illustration and will receive the interested attention of hosiery manufacturers to whom it appeals because of several important points.



A NEW HOSIERY PRESS

The first is the large production, which is of course always welcomed by the manufacturer. The press is controlled and operated by two persons, one on each side, and in the

course of a day's labor these two operators can turn out a production much in excess of the output of three persons using the plate press method. No time is lost; while one operator makes ready, the other presses. Each inspires the other to maximum efficiency.

Although capacity is an important consideration, efficiency and the high character of the finish are even more essential. In the Model L press both results are obtained. The direct application of hot dry steam to the hosiery produces a high luster, while the heavy pressure forms a crease which is almost razor edged.

The new Hoff-Man hosiery press is in successful use in two of the leading hosiery mills in this country. It will be shown in operation at the Knit Goods Exhibition in Philadelphia where manufacturers are invited to send or bring samples to be pressed. The success which has attended the underwear press and the many inquiries for a similar press for hosiery manufacturers leads the builders to feel that they are supplying a machine which will find a large demand awaiting it.

VARIATION IN LENGTH OF HOSIERY

Editor Textile World Record:

I would like to reply to "Fustanella" regarding his criticism of my article in the December issue on variation in length of hosiery. I have at least done some good even if it was only to furnish amusement to "Fustanella." As the article in question was relative to silk hosiery or rather half-hose the question of cotton can be eliminated. "Fustanella" has noticed, I presume, the difference in the fabric caused by a greater or less tension on the yarns due to large or small cones, but as silk is not wound on cones that part can also be ruled out. On bobbins as used today there is very little, if any, variation of tension between a full or nearly empty bobbin, which remains the same shape when nearly empty as when full.

In reference to the difference in speed of knitters, everyone who has had experince in knitting has noticed this, but we will not suppose that any mill will have their mcahines running at one speed for part of a day and a greater or less speed for another part of the day. I believe anyone who has ever been a knitter will agree with my ideas. It is a well known fact that all up to date mills are rewinding their cones on bobbins to get away from the trouble that "Fustanella" mentions. The criticism has directed attention to facts that have been almost forgotten.

Cipango.

THE AMES HOSIERY KNITTING MACHINE

A large production will reduce the cost of the product, but it is necessary to have the product free from imperfections in order to sell the goods successfully and realize a profit on the business. It is to meet these

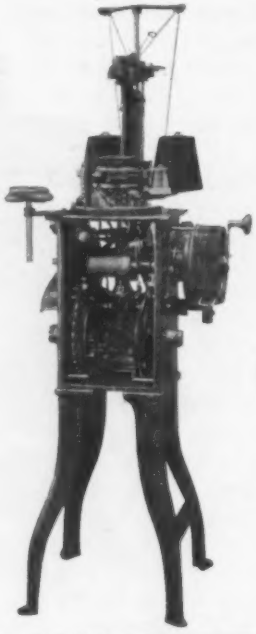


FIG. 1. THE AMES NEW MODEL HOSIERY KNITTING MACHINE

two essentials of successful hosiery manufacturing that the A. N. Ames Knitting Machine Co., Franklin, N. H., have designed and placed on the market an improved machine for knitting plain hosiery. This machine is shown at Fig. 1. It embodies a number of new featurs which have been thoroughly tested before the machine was offered to the trade. Among these is the

pick device for narrowing and widening the stocking, which is simple in construction and operation and has been found to cause a minimum amount of wear on the needles. This device will be highly appreciated by manufacturers owing to the saving in the cost of needles which is an important item in manufacturing hosiery.

The machine has been especially adapted for ladies' string work and transfer work. Owing to the simple and solid construction, the new machine can be run at a speed of 300 revolutions per minute without difficulty.

The A. N. Ames Knitting Machine Co. have exceptionally good facilities for building machine of this kind as regards both high quality and low cost of production and they have spared no effort to make the new machine equal to the best. One of the improved machines is exhibited at the Knit Goods Show in Philadelphia, where hosiery manufacturers can inspect it in operation.

KNITTING ON A FOURTEEN-CUT FRAME

BY GLENCAR

I found on one occasion when knitting fine worsted yarn on a fourteen-cut frame that there was a string of holes for a width of about six inches. These holes did not always come from the same needle wale, they would vary from one to six wales apart. I did everything I could think of before taking the dial out, even taking out the whole section of needles and replacing with older needles and yarn guides. I marked the dial and when it was taken out looked it over carefully with a magnifying glass. Neither dial nor cylinder showed any sharp points or rough edges. Putting the dial back I noticed it was perfectly true. I then got the frame ready to run, but the holes were there just the same. I studied this trouble all day. I tested all the ends to see if all drew alike at different places. For instance, I would have the stop motion finger in front of the frame, regulate the stitches until they were equal, then put the stop motion finger at back of frame and try it again. If the stitches came even at both points it proved the dial was true. This is a good test when the stitches are even and the cloth looks bad.

As a last resort I started the frame and stopped it suddenly, hoping to catch a stitch in the act of breaking. I caught one just right, the yarn was broken where the cylinder needles release. I must have looked at that broken stitch an hour before I noticed that the cylinder latch on the needle after the hole was touching the dial needle. Going over the needles all around with the glass I discovered that the only place where the needles were close were at this point, all others being exactly in the center. I then gave each dog screw a quarter turn and started the frame. It did not stop all the holes, but it was the right idea so I gave them all another turn and the holes stopped. I believe that in cutting this dial and cylinder, one or the other was cut in this spot with a dull tool, or perhaps for some other reason the slots got closer together for a few inches and therefore the needles would not mesh perfectly.

We could not afford to waste much of this cloth, as the yarn was expensive. A hole in every length proved very troublesome, for generally two holes cannot be cut out of a full length union suit. A bunch of waste or a large knot caused a hole and this gave a lot of trouble that I did not have on other frames of different cut. To stop the holes from extra large knots in the yarn I plugged up all the holes but the smallest, in the thread guide wire, Fig. 1. The knitters had to use the smallest hole. This almost caused a riot for the frames would stop for everything except the regular knots and it kept the knitters busy starting up after pulling the large knots through. This, however, stopped the holes from appearing.

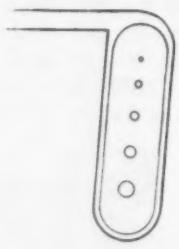
Before moving into our present new building we had a knitting room with a low ceiling, so low in fact that we had to cut off the stop motion shaft about a foot and as a result we could not run the frames as fast as we would like to because the short draw from bottom to top of stop motion was not enough to let the frame have time to stop. Even with a tight brake a few inches would run off the needles before stopping. We

have a new shaft now and all frames run full speed, but there were streaks in the cloth an inch or two long that look as if a tight end had stopped. These short streaks were caused by the yarn catching on the cone for an instant, before releasing. The short length of yarn would run in and give a jerk to pull loose, before the frame stopped.

When these frames were new the take-up was below the base plate and we had more or less trouble with load-ups on the side of the frame, or rather both ends of take-up rollers. It happened in no other place. If enough weight was put on the cloth to hold it tight holes would appear, and if the weight was taken off either tuck stitches or the load-ups would follow. I set the take-up above the plate in the regular place as on the small frames, and all trouble stopped at once. I have found that needles must mesh perfectly, that is, one needle must not touch the other on this fine work. I have had occasion to true a dial several times since these fine cuts were put in. The usual way is to take out all the needles before starting, giving a better chance to see the dial and cylinder when truing. I look now only to see how high I can raise the dial cap. There is plenty of room on all the new frames, and I raise the cap as far as possible and push the dial needles back far enough inside the dial so they will not touch the cylinder needles. I then take out about a dozen cylinder needles back and front and begin. When the dial is true, I push the dial needles out to cast off position under the guide and let the cap down on needles, take cap screws out of cam ring and raise up clear. The cap will then drop in place. I then push the needles back against the cams and return cam ring. This saves about three hours' work on a 20-inch frame in taking out and putting in about 900 needles, or rather about 1,800 needles, for some knitters take out both sets of needles.

All these frames are fitted with inserted walls, dial and cylinder. I recently had a wall break out in the dial and it was a question of only a few minutes to put in a new one. In case of a bad smash, leaving the slot walls bent and broken in the old way, the bad walls can be taken out and new ones inserted, saving time, labor and machine shop bills.

The cam arrangement on these frames is somewhat different from the regular cams. A longer stitch draw cam in the dial gives the cylinder needles plenty of time to release before the dial needles cast off, taking some of the strain from the yarn. The raise-up cylinder cams come up quickly enough to have all the latches open and idle when going behind the yarn guides, which are slightly longer than the regular guides. These guides are hardened and smoothed and will not wear out as quickly as the soft stock guides. Even with all these improvements a knitter has to be constantly on the watch when running a fourteen-cut frame.



THREAD GUIDE WIRE

I finally got the frame to running just right. The mixed needles were straightened out by ordering new needles of one kind to go around and I changed a few frames at a time, keeping the old needles to use in a few frames on work that was not so particular. Another improvement added was a wooden box with three partitions. This box I fastened to the left side housing by a bolt through the casting. I had so many styles running that it was hardly the knitter's fault that the needles were sometimes mixed, for there were six gauges, including the hook gauge, and three cuts of cylinders that looked alike to most of the knitters. They were 11, 12 and 14. We had other cuts, but these three gave the most trouble with the mixed needles. The box fastened to each frame contained only the needles used in that frame, and with this idea we got along fairly well.

Many times I had rolls of goods sent back on account of oil spots. I tried to trace

these spots in various ways with little success. The spots were large and small. We used a large yarn case with rollers to carry the rolls to the wash house. One day I noticed a large drop of dirty oil on the top roll in this box as I walked by. Looking up at the shaft hanger above I saw another drop forming on the bottom of a drip pan under the hanger. I found on examining this pan that the oil from the shaft box dropped to a wire that held up the pan, run down this wire to the edge of the pan and seemed to divide, half going inside and the other half running down the outside and dropping off on the cloth box underneath. By arranging these pan wire differently this dropping was stopped. In a mill where I had worked some years previous I had this same trouble with oil spots, but they seemed to come in bunches of from twenty-five to one hundred small spots in a few yards of the fabric. The balance of the roll might be perfect. It was a long time before we discovered the cause and a piece of tin covering the gears stopped it. When the frame was oiled the oil ran between the bed plate and cam ring to the open space for the gears to run through, and dropped on the nut that held the gear to the shaft. This made one spatter, leaving the nut, the oil made another drop to the center of the take-up rollers near the end, making many more spots on the goods by a second spatter. By putting on gear covers we stopped this trouble.

In this mill there were some old style frames that I had changed over to new style cams and take-up and had the cam rings bushed true and the stop motion ring changed. When these frames returned from the shop they were as good as the latest style frame and run like new. Another improvement that had been made was a yarn rack for worsted and silk yarn. The girls on the winders would put yarn in one side of this rack and the knitters would take it out at the opposite side. This rack was used instead of setting the yarn around on the floor and letting it get dirty.

When I took charge of this room we were compelled to work over time to keep the finishers busy, but at the present time there is at least enough goods ahead to keep the finishers going a month and not knit a stitch.

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AN IMPROVED HOSIERY FRAME

The hosiery frame shown at Figs. 1 and 2, which has recently been patented in this country, is intended to facilitate the handling of hosiery after the material has been dyed and when it is to be stretched on a form and dried. The usual process consisting in stretching the hose in a damp condition over a one-piece wooden form entails considerable loss of time on account of the difficulty in drawing the material over the rigid form, besides subjecting the hosiery to excessive stretching, both in placing it on the form and in removing it. The removal of the hosiery from the form is attended with considerable wrinkling of the goods.

In the improved frame there is a collapsible form over which the hosiery can be placed without any fitting or stretching, the expansion of the form doing this work. The contraction of the form after the drying process permits the hosiery to be drawn off without any stretching or wrinkling.

Fig. 1 is a side elevation of the improved form, a stocking being shown on the form which is expanded; Fig. 1 shows the form collapsed.

The form comprises a sole-piece, 2, the end portions of which constitute parts of the toe and heel; a leg and instep piece, 3, one end of which constitutes part of the toe of the form; and another legpiece, 4, one end of which constitutes part of the heel of the form. These three pieces are narrow metal bars hinged together, bars, 2 and 3, being united by a pintle, 5, at the point of the toe of the form, the bars, 2 and 4, being similarly united at the point of the heel of the form.

The leg bars, 3 and 4, of the form are united at their outer portions by a top bar, 7 hinged to the bars, 3 and 4, and by pintles, 8 and 9. This top bar is formed with a stop lug, 10, produced by striking up a portion of the metal.

This construction provides not only for contracting the form throughout the fore-

part of the foot portion, but also for contracting it between the heel and instep. This latter is of course the widest part of the hosiery form and it is the projection of the heel portion which gives the most trouble in the use of the wooden form. The new form obviates any difficulty in this regard. As shown in Fig. 2 the form may be collapsed throughout its length, including this troublesome heel portion, so that the stocking can be slipped over it without any

FIG. 1

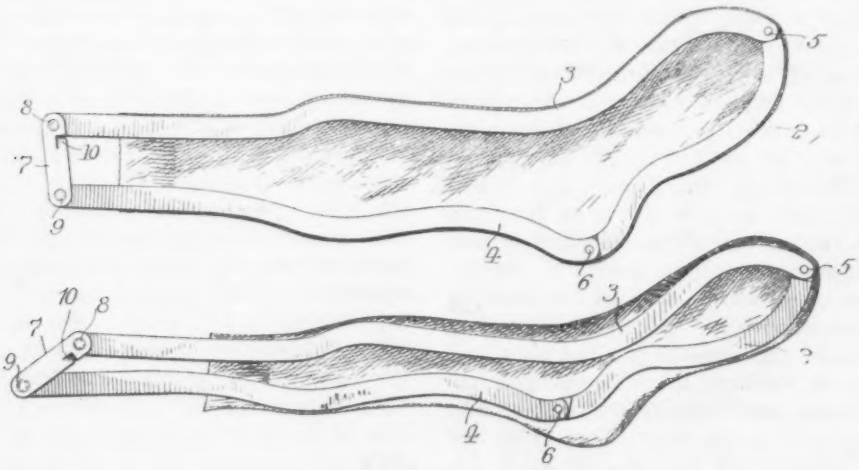


FIG. 2

stretching whatever, and removed with as great ease when the form is collapsed. There is no stretching of the ribbed top of a sock as necessarily takes place in the use of the wooden form in getting this ribbed top past the heel portion of the form. Neither is there any wrinkling of the hosiery in its removal from the collapsed form. The hosiery can be quickly removed from the forms so that no prolonged handling of hot forms is required.

MANUFACTURING HOCKEY CAPS

Editor Textile World Record:

We have read the article in the January issue on the manufacture of hockey caps. "Denbigh" states a 6 feed machine, 8 inches in diameter, cut 96 needles should be used. We have a machine 7 inches in diameter which we used to make caps and wondered if we could buy a new cylinder for it and produce caps on this machine. Please let me know how the caps are brushed and if it is necessary to use cotton yarn. Would not a worsted yarn make a better cap? Welmar (2290).

"Welmar" states he has a machine 7 inches in diameter, but fails to state the number of needles in it and the number of feeds. A new cylinder and dial for this machine could be bought for about $35, but the caps would not be as long as those produced on the 8-inch machine. By carefully adjusting the machine, "Welmar" should be able to produce a good sized cap. The machine might be sent to the shop and an 8-inch cylinder and dial fitted to it.

I have found it best to knit the caps in five-dozen lengths or in one long piece, then sew the end and put it on the brusher. Have the rolls set far enough apart so that the wire will not dig through into the cotton and tear it. Run the cloth through two or three times, turning it each time. This means turning the creases on the side after each brushing into the center so that the caps will be brushed all over.

At the price at which these caps are being sold today it would be necessary to use cotton yarn for the worsted yarn would be too high. The worsted yarn would brush better than the half cotton and worsted, but at the price at which they would have to be sold, I doubt if there would be much if any profit.

Denbigh.

Dyeing, Bleaching, Finishing, Etc.

PREPARATION AND PRINTING OF WOOLEN FABRICS

BY DR. LOUIS J. MATOS

Printing of woolen textiles is a most important branch of cloth making, and includes a very wide variety of fabrics. In certain European textile centers, almost the entire output of the mills includes many handsome fabrics that have been decorated with the highest skill of the printer, and which constitute a conspicuous department of the dress goods establishments.

In this country, constant advances have been made in this class of work, and while the number of print works given over to wool printing are few, the grade of goods manufactured compares favorably with many of the imported fabrics.

Several conditions are imposed, however, in the woolen cloth printing proposition, which must be given very careful and earnest consideration before undertaking the work, otherwise the results desired may not materialize. Successful woolen goods printing depends upon a succession of processes, each of which must be thoroughly carried out and completed before the goods are permitted to pass on to the next process. Batching and sewing in lots should be given good oversight. It often happens that odd pieces occasionally become sewn in, and are not noticed until it is too late.

The most important preliminary operation in the preparation of woolen fabric for printing is the singeing, for which purpose either a plate or gas singeing machines may be used. The more modern way is to use gas, and it seems that the results are on the whole better than when singeing over plates.

From the singeing, the pieces are given a thorough soaping, which serves to remove the particles of burned fibers and also the dressing used on the warps. The soaping is generally done in rope form, keeping the temperature at or as near 100° as possible. First, the pieces are washed for three-quarters of an hour in water only, then run off and given a cold water rinse. The actual scouring is done with an amount of soap necessary to maintain a slight lather, aided by a small quantity of sal soda. A German recommendation is to use 1 pound of soap for each 10 pounds of woolen cloth, and 1 oz. of soda ash, but these quantities are entirely too much for the purpose of such a scour. Of course, the amount of soap depends upon the hardness of the water, and should be taken into consideration.

Allow the pieces to run for three-quarters of an hour in the soap at 100° F., then run off, and wash while running continuously for one-half hour in water at 100° F., made slightly alkaline with sal soda, not soda ash. Afterwards rinse thoroughly in running water, first warm, then gradually colder.

Fine woolens do not resist sudden changes of temperature from warm to cold without showing the result in the feel or handle. After the wash, whiz, run over a spreader, plait down, and make ready for bleaching, which may be done either in the sulphur house, as is still done in some mills, or they may be bleached in solutions of bisulphite of soda, which latter method is the least objectionable, although it requires a separate room or shed for the purpose.

The sulphur house method is well known, but bleaching with bisulphite is not. Bisulphite, either in strong solution or as crystals, is dissolved and made into a stock solution standing at 64° Tw. This is diluted to 10° to 15° Tw., as required for use in the bleach tanks. The cloth to be bleached is run through the bisulphite solution, then squeezed and allowed to remain batched for 24 hours, during which time the bleaching is effected, then washed and scoured slightly, and finally washed well to remove all traces of acid.

Peroxide bleaching is also resorted to, but for some reasons it does not appear to have been adopted as the sole bleach. While peroxide bleaching—whether with peroxide

of hydrogen or of sodium, is the ideal bleach for wool, the cost is somewhat higher than when the sulphur bleach is used. In some cases, however, the peroxide bleach is used as an adjunct to the sulphur bleach where particularly clear grounds are desired.

To increase the absorptive power of the wool fibers for dyestuffs, the preparing or chloring process is used, which consists of passing the cloth through a bath of chlorine resulting from the action of sulphuric or muriatic acid upon a solution of bleaching powder.

The stock chlorine solution is prepared by dissolving bleaching powder in water, decanting, and diluting the clear portion to 10° Tw. The tank through which the goods pass must be equipped with a hood and an outlet provided with an exhauster to lead away the fumes that generally arise, while it is always best to have the tanks enclosed in suitable housings, with proper entrance and exit for the cloth, and outlet pipes for the waste gases.

The proper proportion for chlorine solution and sulphuric acid is 5 gallons of the former to 2 gallons of the latter at 20° Tw. in each 100 gallons of water. For cloth to be finished with heavy colors, the strength may be increased to 7 1/2 gallons of chlorine solution and 3 gallons of 20° Tw. sulphuric acid.

Instead of the bleaching powder solution, some prepare the cloth with sodium hypochlorite, and with the same good results. Muriatic acid is objectionable on account of a tendency to cause the goods to turn somewhat yellowish when they are in the steamer after printing and thus offsetting the benefit of the bleach.

During the passage of the cloth through the bath, the latter is replenished by additions of both chloride of lime solution and sulphuric acid in about the following proportions:

1 gal. Chloride of lime solution, 10° Tw.
5 gals. Water.

and

½ gal. Sulphuric acid, 20° Tw.
5 gals. Water.

Each solution fed in separately, but at the same time.

Preparation of the cloth with stannate of soda (preparing salt) was once quite common, but now it is seldom made use of, except for a few isolated instances.

After preparing the cloth, it is thoroughly well washed to remove every trace of chlorine and acid, as the ultimate success of the printing and steaming largely depends upon the freedom of the cloth from traces of chemicals not actually necessary to fix colors on the wool.

Printing is done chiefly on cylinder machines, although block printing is done to some extent. The shells should be engraved especially for this class of work, being cut deep. The cylinder should have a soft and yielding blanket so that full advantage can be given to the engraving.

Steaming is the crucial test of good printing. Ordinarily the cloth after printing is air dried and then hung on carriages before being put in the steamers. Formerly it was usual to roll the printed goods in slightly moistened cloth for varying periods, and then unrolling just before steaming.

The time of steaming varies. As a rule it is generally convenient to fix a definite time for steaming, and adapt everything to it. Three-quarters of an hour is sufficient. If three-quarters of an hour is decided upon, the steamer boys know exactly what to do, and the output of the establishment is gauged accordingly. After steaming the cloth should be permitted to cool off before being washed, and in no case should warm water be employed, which would only cause the whites to become slightly tinted. It has been recommended by some woolen piece goods printers to add a small amount of common salt to the wash water, but this is impracticable in any plant turning out many pieces daily.

Proper control of the steaming operations, and the regulation of the condition of the steam in the box will do more to keep the output uniform than any other condition. It is wrong in principle to change or alter steaming conditions in any way, and when a

man or boy has been trained to run a pair of steamers it is a mistake to move him around or change his job.

STARCHING AND BLUEING COTTON PIECE GOODS

BY DEMAIN

One of the many important factors in the manufacturing and finishing of cotton piece goods is the starching and blueing processes. Few finishers pay much attention to the blueing. The blue should be kept in a clean place and the barrels kept clean. When the starcher gets a new barrel of blue, whether in powder or liquid form, the barrel should be rolled up and down a few times, so that the solution will be well mixed.

In a piece of white cloth the tone of the blue is most important. As the starcher knows, the cloth after bleaching is of a yellow tone and the way to remedy this is to blue the cloth by putting blueing either in the starch or in the mangle. The best results are obtained by putting the blue in the water before the starch is put in. See that the blue is well mixed before the starch or other material is added. A good blue should be fairly soluble, but not perfectly so. A fairly soluble blue does not blot or spot the pieces. Good blue should be fast to light, because goods that are held in stock any length of time are apt to fade. It should also stand chemic or any acid left in the goods. If a piece of goods is to be starched and an acid blue used and the mixing is on the alkaline side, it causes a lot of trouble. It is, therefore, necessary to use a good blue that will stand any chemic or acid or material used in starching. We have on hand four or five good blues, all different from one another. Some starchers get good results from one blue and another starcher using the same blue would get poor results.

Starchers should experiment with the different kinds of blueing and find out which is best suited to their needs. A good way to test the blues is by the acid test. Take a sample of the different blued pieces and dip them in a weak solution of sulphuric acid and watch the change. A poor blue will turn red or green while a good blue will either brighten or not change at all.

The following points a starcher should keep in mind, as the blueing process is one of the most important factors in the finishing of cotton goods. The blueing sieve should be kept perfectly clean by frequent washing. A copper sieve is the best kind to use as copper seems to brighten the blue. A cloth should be placed under the sieve so that the blue will go through the cloth as well. The mesh of the sieve should be 80 by 80 or 70 by 70. The paddle used to stir up the blue should not be left in the barrel. Good results are obtained when a starcher makes a stock solution of his own blue, sifting it several times, good results are obtained. Be careful that there are no crusts or hard pieces of blue on the sieve, as they will surely spot the goods. When starching white goods, the place must be clean and free from any blacks or colors as the dust from these goods are liable to spot the goods.

The market is always calling for good whites. No matter how good a blue or how it is used, if the goods are not bleached properly the blue will not give even results. All traces of chemic and acid should be washed from the goods before they are starched. If the goods or mixing is on the acid side an acid blue can be used, but if they happen to be on the alkaline side an alkaline blue should be used.

I have found 6 ounces of Edges blue and 6 ounces Ultramarine blue to 100 gallons of starch makes a good blueing. I have also found the following formulas to be of value:

Nainsooks

½ to 1 lb. gum to every gallon water.
50 to 100 lbs. makes 100 gals. starch.
6 ozs. blue.
30 lbs. soluble oil.

White Cambrics

50 lbs. corn.
50 lbs. wheat.
50 lbs. sago.
15 lbs. softener.
6 ozs. blue.
200 gals. starch.

Silesias

39 inch, 68 by 72, 4 yd. twill

100 lbs. cornstarch.
10 lbs. wheat.

10 lbs. sago.
10 lbs. softener.
5 lbs. tapioca.
Boil 10 minutes, making 150 gallons.

Twills

39 inch, 80 by 92, 3.65 yds.

50 lbs. potato starch.
50 lbs. cornstarch.
26 lbs. softener.
Boil 10 minutes, making 300 gallons.

Sateens

31 1/2 inch, 64 by 64, 5.20 yds.

100 lbs. gelatine gum.
20 lbs. white dextrine.
20 lbs. softener.
Boil 10 minutes, making 300 gallons.

Drills

37 inch, 66 by 46, 3.25 yds.

200 lbs. gelatine gum.
200 lbs. white dextrine.
30 lbs. Epsom salts.
20 lbs. softener.
Boil 10 minutes, making 400 gallons.

Pocketing

30 1/2 inch, 64 by 72, 3.25 yds.

75 lbs. white dextrine.
5 lbs. Epsom salts.
8 lbs. softener.
Boil 10 minutes, making 170 gallons.

Toweling

50 lbs. cornstarch.
50 lbs. wheat starch.
50 lbs. sago.
10 lbs. softener.
Blue to shade.
Boil 10 minutes, making 160 gallons.

Cambrics

60 lbs. cornstarch.
40 lbs. sago.
10 lbs. softener.
Boil 10 minutes, making 100 gallons.

Sheetings

36 inch, 48 by 48, 3 yds. and 36 inch, 48 by 52, 4 yds.

25 lbs. cornstarch.
10 lbs. wheat.
10 lbs. sago.
10 lbs. softener.
6 ozs. blue.
Boil 10 minutes, making 160 gallons.

Fancy Sheetings

38 inch, 64 by 64

15 lbs. cornstarch.
35 lbs. white dextrine.
15 lbs. softener.
Blue to shade.
Boil 10 minutes, making 170 gallons.

Imitation of Linen or Linen Finish for Handkerchief Cloth

50 lbs. gelatine or German gum.
10 lbs. cornstarch.
10 lbs. softener.
Blue to shade.
Boil 10 minutes, making 170 gallons.

The finishing process for these goods are carried on as follows: Mangle on a 3-bowl mangle, 2 husk bowls and 1 brass bowl; dye; squeeze on squeezing mangle; starch wet on a 2-bowl mangle; dry and sprinkle. Nainsooks are given three soft nips on the calender. If a light finish is wanted, weight the calender hot with one hot cylinder in the calender. Silesias, drills and drills are chased five to eight times on a 4 or 5-bowl mangle. Sateens are embossed on an embossing or Schreiner calender. Sheetings are chased once around on a 4-bowl calender on each side. Cambrics are finished by two runs through a 3-bowl calender, weighted hot and heavy. Pocketings are finished the same as twills. Shirtings are finished off the frame by chasing three times around 3 bowls covered with cloth.

AFTER TREATMENT FOR SUBSTANTIVE COLORS

An English process of dyeing with substantive colors on cotton has recently been patented in this country, and is described by the inventor as follows: Cotton which has been dyed with the substantive or direct dyeing cotton colors can be after-treated with certain amino compounds in such a manner that the material has many valuable commercial advantages over the untreated stock. The improved process consists in treating cotton dyed with the substantive or direct dyeing cotton colors with certain amino compounds in the presence of an oxidizing agent. Among the amino compounds employed for the production of these new and valuable results are: paraphenylenediamin; p-amido-p-oxydiphenylamin; paramidophenol; orthoamidophenol; homologues of the fore-mentioned, and the following condensation products: paraphenylenediamin and 1 mol. naphthol; paraphenylenediamin and 2 mols napthol; paraphenylenediamine and 1

mol phenol; paraphenylenediamin and 2 mols. phenol; paraphenylenediamin and 1 or 2 mols. cresol; paraphenylenediamin and 1 or 2 mols metaphenylene or toluylanediamin. In order to produce varied results the above amino compounds may be used singly or in combination with each other.

One method of following the process is as follows: Cotton which has been dyed with 3 per cent. of a direct dyeing cotton color, such as titan black, is worked in a bath containing 1/2 per cent. orthoamidophenol, 1/2 per cent. phenol, 20 parts of water, 3 per cent. acetic acid (50 per cent.), 1 per cent. bichromate of soda, for a few minutes in the cold and then gradually raised to 104° F. during about half an hour. The operation may also be conducted in the cold throughout or the temperature may be raised to boiling point.

A DYEING AND SCOURING MACHINE

The dyeing machine shown in the accompanying illustrations has recently been patented in this country. It embodies a number of improvements in the preparing, dyeing and washing of tops, slubbing, wool, yarns, silk, mohair, alpaca, jute, and other fabrics and also in the washing of laundry linen and goods and relates to that class of dyeing and washing machines in which the dye or washing liquor passes downward through the material carried in an inner cage after such liquor has been forced upward so as to fall over the cage. Fig. 1 is a longitudinal section of a tank to which the improvements are applied. Fig. 2 is a transverse section of the tank.

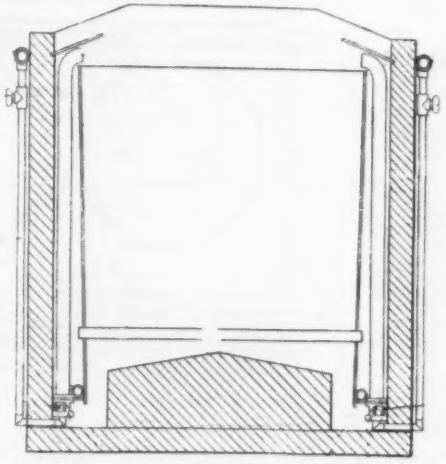


FIG. 2. A TRANSVERSE SECTION OF THE TANK

The rectangular tank is made of wood or sheet metal. The bottom of the tank is formed with a raised central portion to displace the liquid and economize it. This raised portion forms with the walls of the tank a recess all around the tank. The tank is formed with an inner vessel by sheet metal side plates and a false bottom located above the top of the raised central portion. The plates are located a certain distance

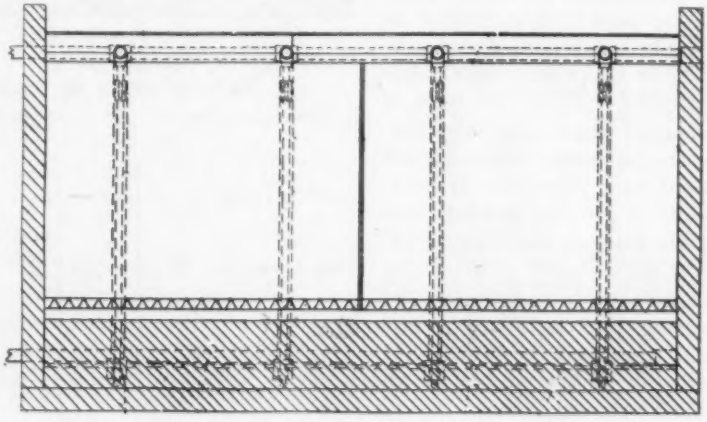


FIG. 1. A LONGITUDINAL SECTION OF A TANK

from the sides of the tank so as to leave a longitudinal space, Fig. 2, at each side between the sides of the inner vessel and the sides of the tank. A longitudinal opening is left between the bottom edge of each side of the inner vessel and the bottom of the recess. The inner vessel is divided into two or more compartments by cross partitions.

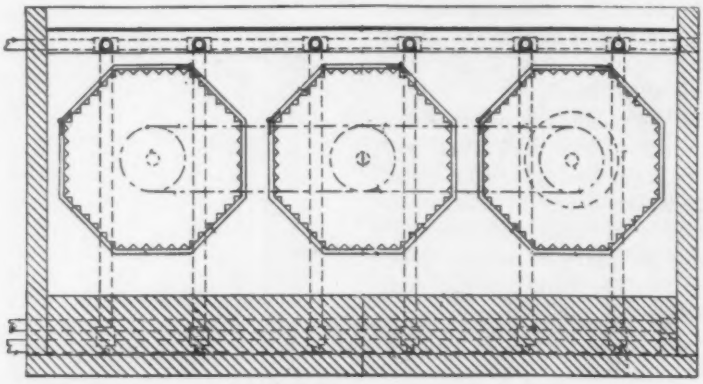


FIG. 3. A ROTARY CAGE

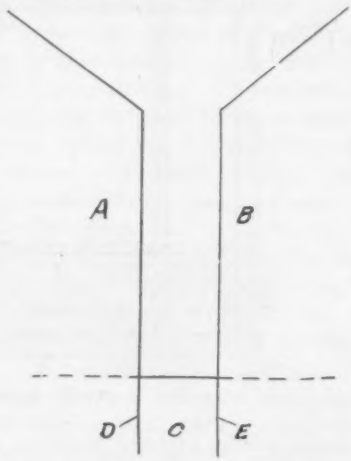
Each compartment may be provided with a rotary cage, Fig. 3, pivoted by supporting short shafts or studs at each end to the sides of the tank, and the cage may be rotated by either the hand from the square ended portions of the shafts or by power. The cages may be rounded off or built in the form of a polygon, the sides of which form false bottoms in their lowest position. The sides are composed of metal bars triangular in cross section in the form of grids or gratings and one or more of the sides of each cage form its lid or cover. One or more or all of the cages may be used at the same time and the gearing for rotating the cages are so arranged that each cage may be worked or rotated independently of the others or all cages may be rotated simultaneously.

The pipes for conducting the steam into the liquor are located in the recess at each side of the tank and are supported on projecting plates. These pipes are provided with perforations at intervals along their lengths for projecting the steam, causing the liquid to flow upward. The liquid is deflected by the inclined baffle plates located over the top edges of the inner vessel onto the tops of the compartments or rotary cages and percolates through the material in the compartments by gravitation to the bottom of the tank into the recess. This action is accelerated by the partial vacuum formed through the liquid condensing the steam.

A SULPHUR BLEACH HOUSE

BY CULEBRA

The answers to the question as to the best form of house for stoving woolens in the March number are excellent. I doubt very much the statement that an Englishman in 1837 was the first to bleach hosiery with sulphur fumes. There are frescoes exant at Pompeii that show that the ancient Romans



A SULPHUR BLEACH HOUSE

understood the practice. In the answers, however, no reference is made to a practical arrangement for rush work. Even in works where stoving is not an every day affair there are times when there are large batches on hand. In any case it is better to have two small houses on the principle shown in the illustration, than one large shed. The houses, A and B, have a sulphur furnace, C, in common; it can be opened on to either chamber or trapped off by doors, D and E. The advantage is that while the goods are stoving in A, the attendant can be filling B, and the sulphurous acid can be turned on to B, as soon as the process is finished in A. In the meanwhile A is cleared of fumes, the goods are removed and a fresh batch put in and so on. This ensures a continuous process and saves time and sulphur.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 50

GREEN ON UNION CLOTH

Helvetian Brilliant Green G on 100 lbs. union cloth. Prepare the dye bath with

2 lbs. Helvetian Brilliant Green G.
(Swiss Colours Co., 15 E. 12th St., New York, N. Y.)
2 lbs. Sal. Soda.

Enter at 140° F., allow goods to remain half hour, turn on steam, then add

20 lbs. Glauber's Salt,

boil half hour, shut off steam. Allow bath to cool down, steep for one hour, and rinse in three waters.

Helvetian Brilliant Green G is especially noted for its pleasing brilliancy and level dyeing properties, also good fastness, and covers cotton, wool and silk identically the same shade from one direct bath.

Recipe No. 51

BROWN ON COTTON YARN

Diamine Brown M Z on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Diamine Brown M Z.
(Cassella Color Co., 182 Front St., New York, N. Y.)
30 lbs. Common Salt.
1 lb. Soda Ash.

Enter at 180° F., dye at a boil for one hour.

Diamine Brown M Z gives an excellent shade of brown possessing the characteristic properties of the direct cotton colors.

Recipe No. 52

TAN ON WORSTED DRESS GOODS

Tan on 100 lbs. worsted dress goods. Prepare the dye bath with

266 grs. Amazo Fast Red 8 B.
(American Dyewood Co., 80 Maiden Lane, New York, N. Y.)
1 oz., 23 grs. Amazo Fast Yellow 6 G.
56 grs. Amazo Fast Blue.
20 lbs. Glauber's Salt.
2 lbs. Oil of Vitriol.

Enter at 120° F., bring to boil and boil one hour or to shade.

The above colors are recommended for their excellent fastness to light and good leveling properties.

Recipe No. 53

RED ON WORSTED DRESS GOODS

Red on 100 lbs. worsted dress goods. Prepare the dye bath with

384 grs. Amazo Blue.
(American Dyewood Co., 80 Maiden Lane, New York, N. Y.)
5 ozs., 122 grs. Amazo Brilliant Red 2 B.
419 grs. Amazo Fast Yellow L R.
20 lbs. Glauber's Salt.
2 lbs. Oil of Vitriol.

Enter at 120° F., bring to boil and boil one hour or to shade.

The colors used to produce the above shade have excellent leveling properties and are of good fastness to light.

Recipe No. 54

RED ON COTTON YARN

Benzo Rubine H W on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Benzo Rubine H W.
(Beyer Co., 117 Hudson St., New York, N. Y.)
40 lbs. Glauber's Salt Crystal.

Enter yarn at 180° F. and dye at a boil for one hour.

Benzo Rubine H W possesses relatively good fastness for a direct cotton color.

Recipe No. 55

BLUE ON WORSTED YARN

Guinea Cyanine L R on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Guinea Cyanine L R.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Guinea Cyanine L B possesses excellent fastness to alkalies, and good fastness to light, acids, rubbing, decatizing and carbonizing.

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Recipe No. 56

BROWN ON WORSTED YARN

Fast Wool Brown R L on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Wool Brown R L.
(Kalle & Co., 530 Canal St., New York, N. Y.)
1 lb. Sulphuric Acid.
10 lbs. Glauber's Salts.

Wet out the yarn and enter at 105° to 125° F. and bring slowly (in about 30 minutes) to the boil.

Boil 45 minutes and add

1 lb. Sulphuric Acid

and boil another 30 minutes.

Fast Wool Brown R L possesses exceptional fastness to light.

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Recipe No. 57

BLUE ON COTTON AND WORSTED UNION CLOTH

Union Blue 2030 on 100 lbs. union cloth. Prepare the dye bath with

4 lbs. Union Blue 2030.
(Innis Speiden & Co., 46 Cliff St., New York, N. Y.)
20 lbs. Common Salt.

Enter at 100° F., work at this temperature for 20 minutes, then bring to a boil.

Boil 20 minutes and then work in the gradually cooling bath 20 minutes longer. Lift, rinse and finish.

Union Blue 2032 is an exceptionally level dyeing color for cotton and wool union piece goods.

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Recipe No. 58

BROWN ON WORSTED YARN

Palatine Chromate Brown G G T X on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs., 6 oz. Palatine Chromate Brown G G T X.
(Badische Co., 86 Federal St., Boston, Mass.)
20 lbs. Glauber's Salt. (Calcined)
2 lbs. Potassium Bichromate.

Enter the yarn in a luke-warm bath to which the (previously dissolved) dyestuff has been added together with the other ingredients.

Raise slowly to a boil and then exhaust the bath by adding gradually about

8 lbs. Acetic Acid, 9° Tw.

Very dark shades require a further addition of 1 lb. of sulphuric acid.

Palatine Chromate Brown G G T X possesses very good fastness in nearly every respect.

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Recipe No. 59

YELLOW ON WORSTED YARN

Acid Milling Yellow 5 G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Acid Milling Yellow 5 G.
(Geisenheimer & Co., 189 Front St., New York, N. Y.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 160° F. and dye at a boil for one hour.

Acid Milling Yellow 5 G possesses very good fastness to light and in most other respects. White cotton effects threads are not stained. It will also be found valuable as a silk dye.

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Recipe No. 60

BLUE ON WORSTED YARN

Guinea Cyanine L B on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Guinea Cyanine L B.
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F. and dye at a boil for one hour.

Guinea Cyanine L B possesses excellent fastness to alkalies, and good fastness to light, acids, rubbing, dacatizing and carbonizing.

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Recipe No. 61

YELLOW ON WORSTED YARN

Brilliant Fast Yellow 6668 on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Brilliant Fast Yellow 6668.
(Innis, Speiden & Co., 46 Cliff St., New York, N. Y.)
10 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter at 120° F. and dye at a boil for one hour.

Brilliant Fast Yellow 6668 possesses excellent fastness to light.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Opening and Mixing Machine for Cotton Waste. The Potter & Johnson Machine Co., Pawtucket, R. I., have placed on the market an improved machine for opening and mixing cotton and cotton waste. An article describing the machine appears in another part of this issue.

Hosiery Knitting Machine. The A. N. Ames Knitting Machine Co., Franklin, N. H., have placed on the market an improved machine for knitting hosiery which is described in another part of this issue.

Drawing-in Machine. The Steel Heddle Mfg. Co., Philadelphia, Pa. A drawing-in machine, known as the "Simplex," which dispenses with the services of a hanger-in. A description appears in this issue.

Improved Worsted Comb. Price Smith & Son, Keighley, England, have recently brought out a worsted comb embodying a number of improvements in construction.

Selvage Motion. Stephen Wilkinson, Colne, England. An improved motion for weaving a plain selvage on sateens, twills, drills and similar goods. The motion comprises a series of levers actuated from the lower shaft of the loom.

Shoddy Cylinder. J. N. Heimrich & Son, Iglau, Maehren, Germany. An improved cylinder for shoddy machines which is said to embody a number of improvements over the regular construction.

Wool Scouring Machine. A. Thibeau & Co., Tourcoing, France. An improved machine for scouring wool which is said to be giving satisfaction in the Roubaix-Tourcoing district of France.

Cotton Comber. Elsaessischen Maschinenbau-Gesellschaft, Muelhausen, Germany. An improved drawing-off motion for cotton combers.

Heddle Eyes. Paul Keller, Luettringhausen, Germany. An improved eye for heddles which is said to be specially adapted for weaving yarn having very little strength or twist, such as artificial silk.

Warp Stop Motion. Otto Horn, Kunnersdorf, near Bernstadt, Saxony. An improved warp stop motion for looms which is said to embody a number of improvements.

Speed Regulator for Mules. G. Josephy's Erben, Bielitz, Austria. A device for varying the speed of the carriage of woolen and cotton mules.

Cloth Testing Machine. Prof. Franz Krynes, Vienna, Austria. A machine for testing the strength and elasticity of cloth. It embodies a number of improvements.

Dyeing Machine for Hats. Gius. Bossi Nachfolger, Vienna, Austria. An improved machine for mordanting and dyeing wool hats.

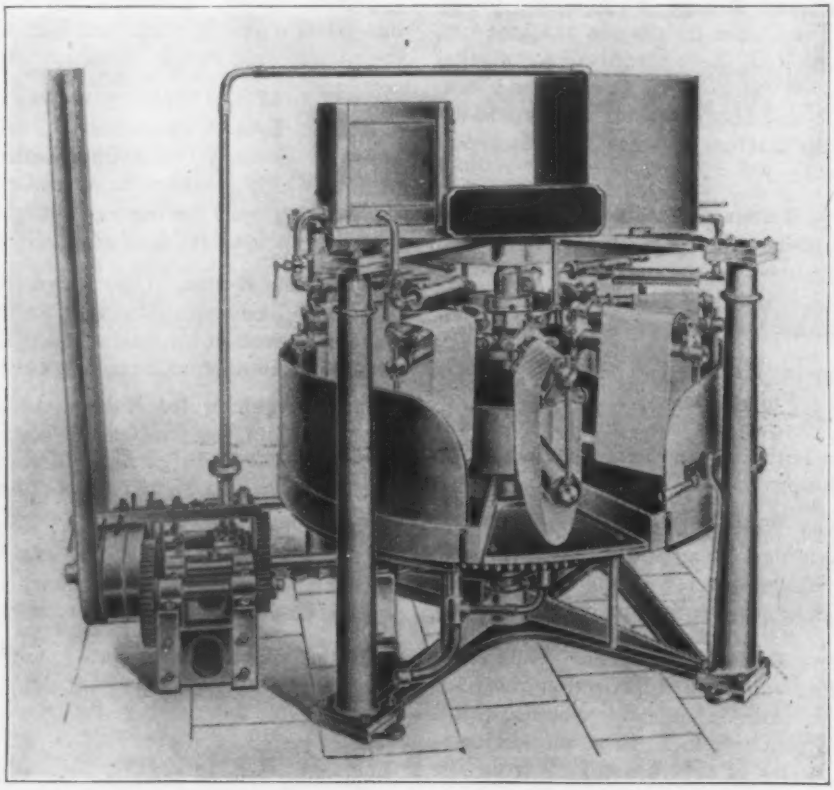
Steaming Printed Samples. Dr. Wladislaud Poplawski, Lodz, Russia. An apparatus for steaming small samples of printed textiles for laboratory tests.

Condenser for Woolen Cards. Hermann Maly, Guben, near Frankfurt, Germany. An improved condenser for woolen cards. Rub rollers and rub aprons are combined.

Jacquard Attachment. B. Toone, Nottingham, England. An improved method for detecting mistakes in the punching of jacquard cards.

THE SPENCER IMPROVED HANK MERCERIZING MACHINE

This machine, known as the Spencer hank mercerizing machine, built by the Textile Finishing Machinery Co., Howard Bldg., Providence, R. I., consists of two sets of horizontal arms made in four sizes and radiating from a vertical shaft. The top arms are made adjustable so as to suit any length of hank. At each end of the upper radial arms is a triangular bracket between which rollers are fixed. A larger roller is mounted on each of the bottom arms. The attendant remains in front of the machine and places the yarn on one of the radial arms in the bottom roller. The tension is automatically applied to the yarn and the hanks stretched at every one-ninth of a revolution. The vertical shaft and the arms move automatically one-ninth of a revolution from left to right, bringing the arm on the left in front of the attendant, to be doffed and recharged with new hanks. The arms that have moved one-ninth of a revolution to the right, place the hank in the first caustic bath, of which there are four. At the fifth operation the hank is squeezed or drained, to remove the superfluous caustic. At the sixth, seventh and eighth operations the hanks is washed either by means of hot or cold water. The attendant can regulate the time the yarn is under treatment at each operation, thus increasing or decreasing the production.



THE SPENCER HANK MERCERIZING MACHINE

If the yarn is treated for one minute at each operation, it will get four minutes in the caustic, one minute's squeeze, and three minute's washing, and the attendant will have one minute to doff and recharge the machine. If one pound of yarn is placed on each set of rollers the production is 600

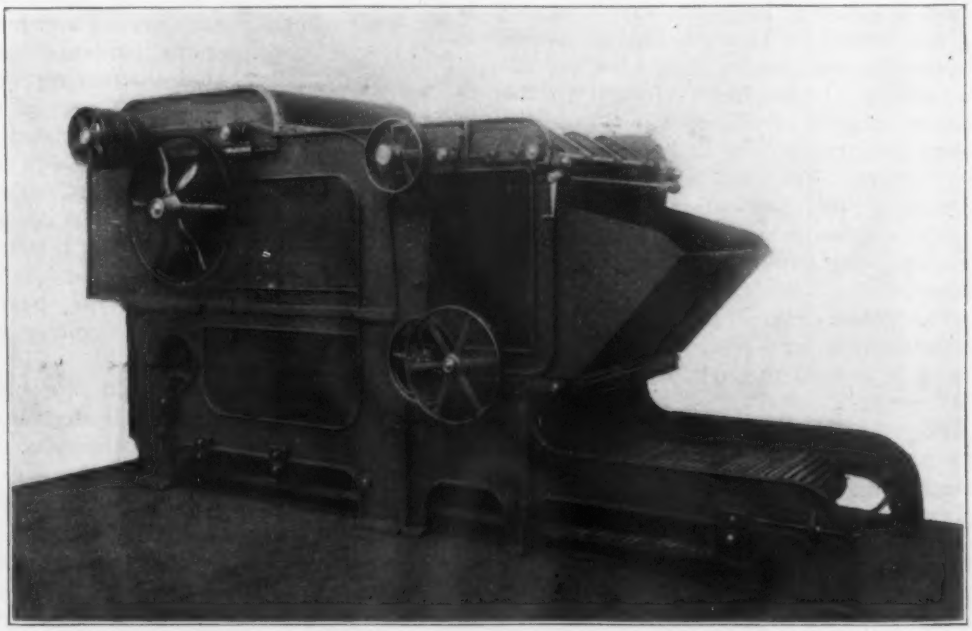
pounds in ten hours, for the nine-arm machine. The caustic is continually being circulated by means of a centrifugal pump. Heretofore when the yarn becomes saturated with caustic, the strain is so severe that it pulls the arms together at the front, so that the skeins are stretched unevenly, being shorter at the front than at the back. This difficulty is remedied by the Spencer machine, the arms being kept exactly parallel, however great the tension. When the machine is once set to the required tension, the attendant has only to doff and recharge the machine, the hank in every case being subjected to the same tension.

The advantages of this machine are summarized as follows: Greater production; very simple in mechanism and not liable to get out of order; great saving in space; only one attendant required; the rollers are a dead set, and will not give way under the greatest tension; the process is completed at one operation.

The Spencer machine has been in operation in European mills for several years, over five hundred of them being in use in Europe at the present time.

A MACHINE FOR OPENING AND MIXING COTTON AND COTTON WASTE

The machine shown in the accompanying illustration is built by the Potter & Johnson Machine Co., Pawtucket, R. I. It is intended for opening raw cotton and mixing with it the card sliver, drawing sliver and other waste which has been made in subsequent processes. Card and drawing sliver and combing lap waste can be thrown directly into the mixing hopper. The spiked apron and comb break up the waste into very small pieces, and deliver same into the raw cotton hopper in this finely divided state, and is thereby thoroughly mixed with the new cotton. Spinners' waste is first run through a thread extractor, and roving waste through a roving waste machine before being fed into the hopper. This opening and mixing machine is also used to advantage for mixing different grades of cotton.



A MACHINE FOR OPENING AND MIXING COTTON AND COTTON WASTE

Frequently it is desirable or necessary to mix one or more bales of a lower grade with a large lot of cotton. For such purposes the opener and mixer has proved very useful. The machine can be arranged with the Potter & Johnson double hopper feeder, enab-

ling colored cotton to be mixed more uniformly than is possible by weighing separately and mixing on the floor. This machine was in operation at the Boston Textile Exhibition.

THE SCOTT COMBINED POWER YARN AND CLOTH TESTER

The combination automatic power yarn and cloth tester, manufactured by Henry L. Scott & Co., 223 Eddy St., Providence, R. I., is a practical, accurate and thoroughly dependable machine for both yarn and fabric testing. It has been brought to that highest degree of efficiency and accuracy which distinguishes the Scott standard testing devices. The dead weight principle is applied to the combination tester because experience has proved it to be thoroughly reliable, being based on gravity, which does not vary.

The human equation is entirely eliminated as the Scott tester is power driven. Uniform speed is assured throughout each test and each series of tests. Hand operated testers are very apt to give variable results depending upon the rapidity and steadiness with which the hand crank is turned. No such variations can take place in the power machine. It provides for two speeds, moving the stretching screw 12 or 36 inches per minute. At the completion of the test, the gears shift and a quick return to starting position is made. All parts of this machine are built on U. S. standards and can be removed without dismounting the machine itself from the wall. It is mounted upon two iron frames of I-beam section, insuring a solid, rigid unit that remains in perfect alignment. The head is contained in a solid, one-piece casting, protected against dust by tight fitting joints. The mechanism runs smoothly and without undue friction on ball-bearings, which are a unique feature of Scott testers and a strong factor in their dependability.

Another point of great advantage is the wear-proof, double quadrants fitted with two gravity pawls that prevent all back-play. A positive stop is assured at the instant the sample breaks. The resetting device is very simple, it being necessary merely to pull the handle suspended from the quadrant, which allows the joints to return to zero. If any one part of their combination tester stands out prominently above the others, it is the gear box and its contents. This is built in three sections, all easily accessible by means of a hinged cover with tool steel latches and four screws. The bearings are of ample size to care for heavy loads. The gears and clutches are mechanically perfect and made of machine cut, specially hardened steel. Ball thrusts assure an instantaneous grip.

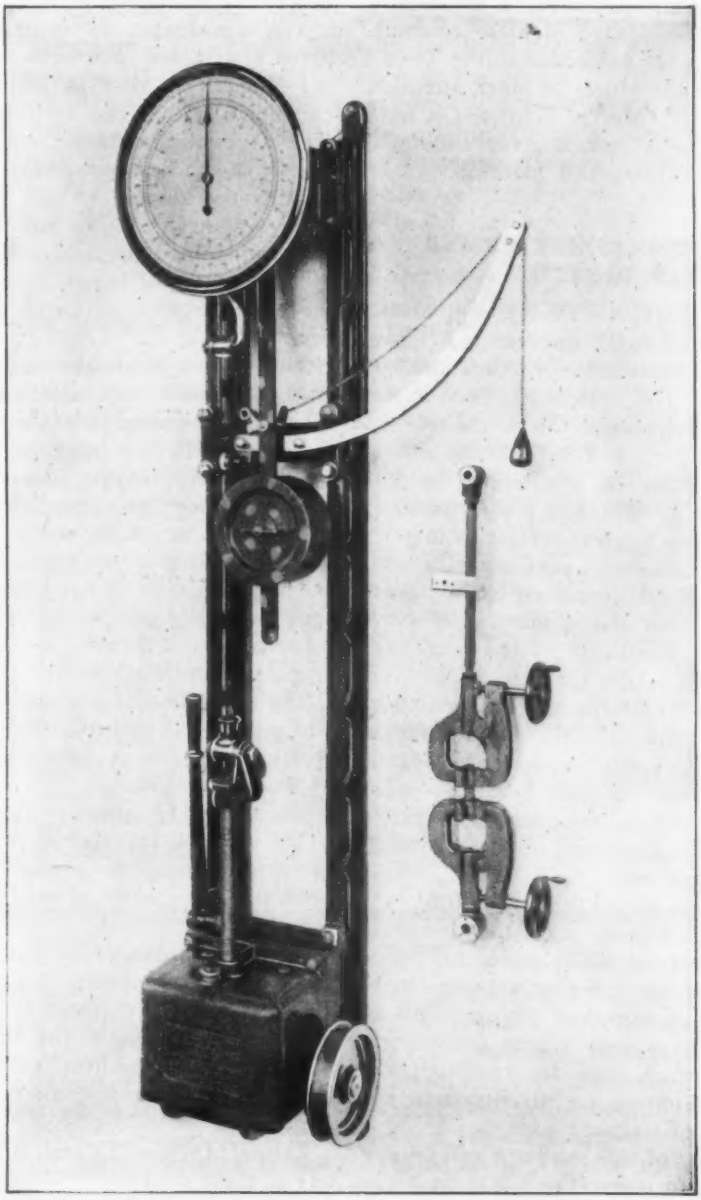
The long reach between the ends of the sample being tested will be appreciated by those who have had experience with the tangling of samples. The generous working space allows quick handling of samples and greater efficiency. The spools on the Scott testers are of high efficiency and quality. They are of the revolving type, heavily nickeled and of the proper diameter and width for all yarn testing.

The clamps for testing cloth are made chiefly for strength and are of steel channel section. A large space is provided between the jaws so that large samples may be inserted and any part tested with the greatest ease. All parts of a large bolt of cloth can then be reached for practical testing. The flat grip prevents slipping or twisting. The sample is securely gripped as in a vice by means of powerful, but easily turned hand wheels. The anvils are quickly interchangeable for various standard widths, 1/2 in., 1 in. and 2 in., and of any length desired.

The machine is started with the sample in place, by pulling forward the auto lever at the left of the machine. At the instant the sample breaks, the machine stops pulling and reverses, returning the stretching screw and its spool to the original positions and then stopping again ready for another test.

To test and correct the accuracy of the combination tester, simply suspend a body of known weight from the upper yarn hook. The indicator or the dial should then record the number of pounds of the article suspended from the hook. This proves an easy

and reliable way to prove the accuracy of the machine to anyone who questions the



THE SCOTT COMBINED POWER YARN AND CLOTH TESTER

tests made upon it. The Scott combination power yarn and cloth tester is designed and built of the best materials by high grade

workmen and there is no reason why, if given good care and not handled carelessly, it will not last for a number of years. It represents fifteen years of experimental work in cooperation with the world's largest tex-

tile mills and with the U. S. Government textile experts. It conforms to all requirements of the U. S. standards and will be accepted as standard wherever a dependable tester is required. One of these combination testers was on exhibition at the Textile Show and was the object of much attention from the visitors. Messrs. Scott & Co. have issued catalogue C which gives additional information regarding this machine.

COMBINATION SPRINKLER AND HEATING SYSTEM

The G. M. Parks Co., Fitchburg, Mass., have arranged to install the Nutter & Chatman system of automatic sprinklers and hot water heating. This system has been in the course of development for a number of years and is protected by patents. It is based on the idea of circulating the hot water through the sprinkler pipes, and adding as much more heating surface as may be necessary in the form of auxiliary radiation. The amount of additional radiation necessarily depends on the climate. In New England about two-thirds of the total surface required is in the sprinkler pipes. In the South, very little additional radiation would be necessary. The two kinds of radiation may be kept entirely separate if desired, so that either or both may be in use independent of the other, but under no condition is the ordinary operation of the sprinkler system interfered with.

The success of one of these combined systems of course depends upon the thorough insulation of the sprinkler head, from the heat in the hot water which is being circulated through the sprinkler piping. This is accomplished by a very simple goose-neck arrangement which provides two separate insulating mediums,—one of entrapped air and the other of stagnant water.

The efficiency of this insulator will be appreciated when it is explained that on a recent test, at the end of six hours, with a circulating water temperature of 242° in the sprinkler pipe, the temperature under the sprinkler head was only 114°, and the temperature of the surrounding air in the room had risen to 97°. This is obviously a severe test, since the water in a system of this sort is never heated up to 242°. 200° is more nearly the maximum.

The advantages in favor of this combined system are summarized as follows:

Reduction in cost to owners since this combined system can be installed cheaper than a regular sprinkler equipment and a regular steam heating system.

Deduction in operating cost, since no other system of heating can compete in fuel cost with forced circulation hot water.

The amount of piping is minimized since the sprinkler pipe performs a double function.

This system is an absolute test for stoppage in sprinkler pipes. Owners of regular sprinkler equipment have implicit confidence that water will flow from the sprinkler head when the latter is opened by heat. There are many cases on record, however, where unsuspected stoppages have prevented the proper working of the sprinklers.

The circulation of hot water through the sprinkler pipes will prevent freezing and in many cases will do away with expensive dry pipe valve installations.

The circulation of hot water in the sprinkler pipes will prevent condensation on sprinkler pipes, a common complaint in dye houses, paper mills, etc.

There is no objection to the circulation of water through the sprinkler system so far as deterioration of piping is concerned, since the same water is used over and over again.

There is no danger of scalding an operative, due to the opening of a sprinkler head. During the time required for the water to fall from the ceiling to the floor of an ordinary mill room, the heat is liberated so rapidly to the surrounding air that no burning is possible.

The G. M. Parks Co. are starting work on one of these systems in Worcester, Mass., in a nine-story concrete factory building, owned by the Worcester Building Trust. This building was originally planned to be heated by steam, and about 20,000 sq. ft. of radiation was required. With the combined

system, only 8,000 sq. ft. of radiation is being installed, the balance being in the sprinkler piping.

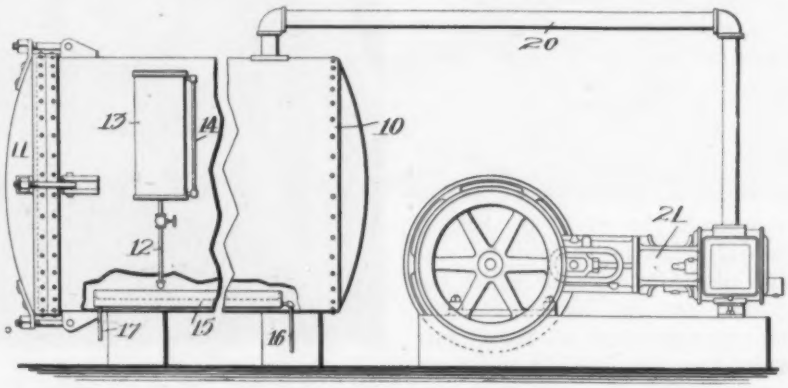
Of late the G. M. Parks Co. has made a particular study of piping that will combine economy for the consumer. This company acts along lines of the construction engineer. This is pioneer work in the piping field, combining engineering and contracting in special work such as humidifying, compressed air service, power revision and so on. The new combination of heating and sprinkling is an extension of lines with which they are already familiar.

APPARATUS FOR MOISTENING YARN

The illustration shows an apparatus for moistening yarn recently patented in this country. The patent has been assigned to C. G. Sargent & Sons Corp., Graniteville, Mass. The inventor describes the machine as follows: Yarn after being spun retains its tendency to kink, due to its twist, and if the filling is not aged sufficiently and the twist thus set, as it is unwound from the bobbins, tubes, or cops, it will cause serious imperfections in the finished goods and interfere with the efficient handling of the yarn during the operations which it passes through in the mill. On this account moisture is generally introduced into yarn, and it is also brought to a fixed standard, but it has been found difficult to accomplish this readily and to make the moisture content of the yarn uniform, particularly where it is wound on cones or cross-wound to a comparatively great depth.

Under ordinary circumstances the yarn standing for a number of hours in a room with the humidity near the dew point will take up the proper percentage of moisture only on the outside layers, particularly if it is cross-wound. It has been found also that if the yarn is used in rooms which are not themselves kept moist, the moisture will leave the yarn and this lessens the strength of the yarn, it being well understood that when the yarn contains the proper amount of moisture it is stronger than otherwise.

In the new apparatus a main cylinder or chamber, 10, is provided with a door, 11, at one end which can be removed when the chamber is to be charged or emptied. Extending from the bottom of this chamber is a pipe, 12, having a valve and connected at its upper end with a water charging receptacle, 13, having a water glass, 14, connected with it at the top and bottom. This water glass is graduated so that the amount of water in the receptacle at all times can be ascertained. At the bottom of the chamber, 10, is a surface evaporator, 15, adapted to be filled by water from the pipe, 12. The chamber is provided with a double bottom and has a steam coil with an inlet, 16, and an outlet, 17, for the steam. The chamber is connected at any convenient point by means of a pipe, 20, with an air pump, 21.



AN APPARATUS FOR MOISTENING YARN

The yarn is first weighed and the operator decides how much moisture is to be introduced into the yarn. Then he opens the valve, 12, allowing the amount of water which he wishes to introduce into the yarn to run into the evaporator and then shuts off the flow. The air is then exhausted from the cylinder or chamber, 10, by means of the air pump and steam is allowed to pass into the coil in the evaporator. Under ordinary conditions a 28-inch vacuum is provided with the barometer at 30 inches. The water which has been drawn into the evaporator will pass into vapor at 101°, and consequently the yarn does not have to be heated materially above the temperature of the rooms in which it is to be used, and it cannot be injured by the heat employed. Nor is the water lost from the yarn so readily as it would be if introduced at a higher temperature. The heat is kept on until the water has been entirely evaporated. As it is in the form of vapor it passes directly into the yarn and replaces the air which has been exhausted previously. Those yarn layers which are nearest the center of the tube, bobbin or cop receive as much moisture as those on the outside, because the air has been exhausted from them and the moisture is the only thing that can take its place.

When all of the water in the evaporator has been vaporized, the steam is shut off and the temperature in the chamber allowed to fall to that of the room, after which the door is removed and the yarn taken from the chamber. As a result an absolutely safe way is provided for introducing any desired amount of moisture into the yarn no matter how the yarn is arranged. At the same time a system is provided in which it is necessary for the moisture to enter the innermost convolutions of the yarn and thus provide a uniform moisture content throughout the entire length of yarn on each bobbin or cop.

The first carpets made in the United States were by William Calverly at Philadelphia in 1775. He was followed by William P. Sprague, who made Turkish and Axminister carpets in Philadelphia in 1791.

THE SIMPLEX DRAWING-IN MACHINE

The drawing-in machine shown in the illustration, is built by the Steel Heddle Mfg Co., 2100 West Allegheny Ave., Philadelphia, Pa. By means of this ingenious device the labor of the hander-in is dispensed with. The drawer-in touches a pedal with her foot and this automatically releases the next

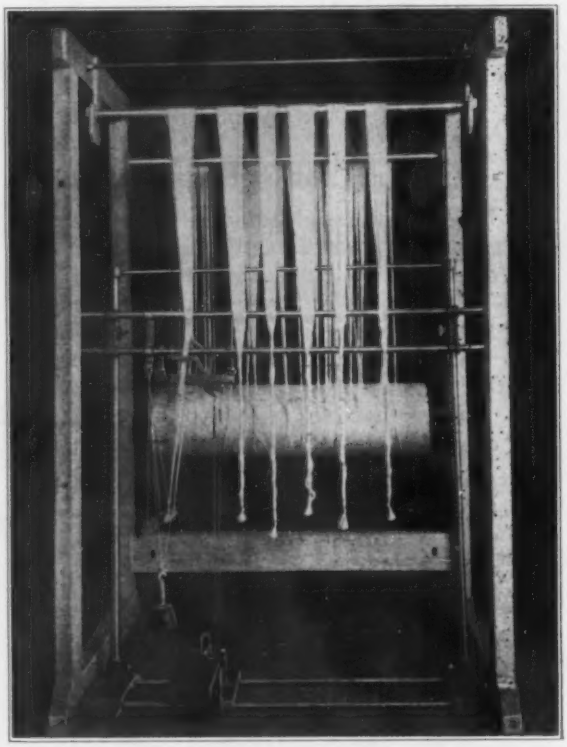


FIG. 1. A GENERAL VIEW OF THE SIMPLEX MACHINE WITH THE WARP IN POSITION

warp thread to be drawn in from the ends which are fastened with a clamp and held tight by a weight. The thread to be drawn in is placed in a free position in the lease rods and is caught by the hook of the operator as readily as if a hander-in had held it in place. As soon as a thread is drawn through the heddle, the drawer-in presses the pedal and brings the next thread in place.

A large amount of labor is saved and a greater production is obtained by using this

machine. No hander-in is required and there is no loss of time because of the drawer-in waiting for the hander-in to place the thread in position. The Simplex machine does not require any mechanical attention. It is easily operated and always ready for use. It will fit any warping room. Fig.

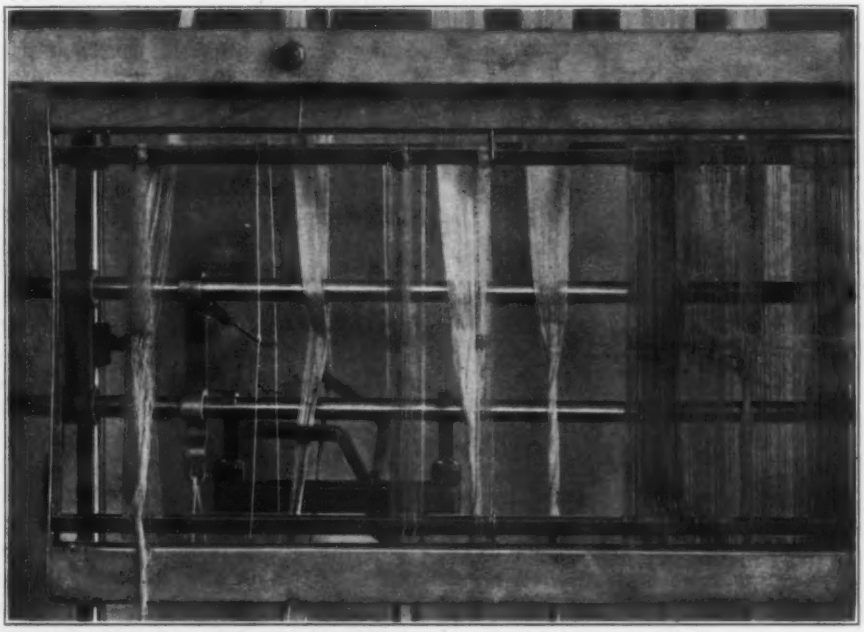


FIG 2. THE SIMPLEX DRAWING-IN MACHINE WITH THE HARNESS READY FOR ENTERING

1 is a general view of the machine with the warp in position. Fig. 2 shows the machine with the harness ready for entering.

Of the 1,324 establishments in the United States for the manufacture of cotton goods reported for 1909, 163, or 12.3 per cent., manufactured products valued at $1,000,000 or over, and included in this group were 5 establishments with products valued at $5,000,000 or over.

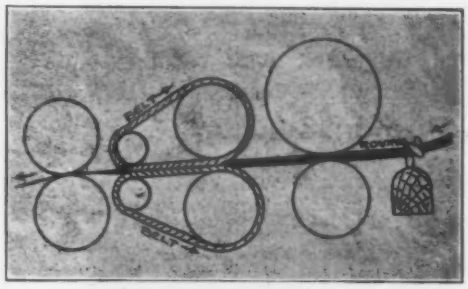
The first mechanical spinning mill was erected in 1801 in St. Gallen, Switzerland. In 1811 Heinrich Kunz, known as the "Spinning King" in Switzerland, erected a small mill with 14,000 spindles, laying the foundation of what is now the most important spinning concern in that country.

THE CASABLANCA SPINNING PROCESS

Further information regarding the practical application of the new spinning methods devised by Senor Casablanca have been awaited by spinners and textile machinists in this country. The original claims appeared so extravagant and the details available were so meager that no definite or useful opinion could be given. Since the publication of the matter in our issue of October 14 last the inventor has made certain improvements which certainly bring the apparatus within the range of practical use. The original form was to a certain extent cumbersome and complicated, while the considerable length of leather belting required for the average number of spindles in a mill would certainly have told against its wide adoption or economical operation. The claim is still made, however, that the results then formulated—namely, the spinning of 80s with a one-hank roving—were obtained quite well with the original form of apparatus: and the only reason for alteration was to reduce the number and complexity of the parts.

The accompanying illustration shows the

new arrangement. It will be noted that the section is not very materially different from that of an ordinary ring frame. In place of the comparatively long belts used, and the necessary series of driving and tension rollers, there are the usual set of front rollers, middle rollers, and back rollers. The belts, which are much shorter than in the original form, are guided by small rollers placed near to the nip of the front rollers.



THE CASABLANCA SPINNING DEVICE

The lower of the two belted rollers is the driving roller.

The belts are elastic, and greater or less pressure is placed upon them; but the pressure is never sufficiently great to impede the slipping or drafting of the fibers between the belts. It will be recognized that the most essential feature of the apparatus is the two belts which convey the fibers of the sliver or roving into the nip of the front rollers. The belts travel very slowly and, apparently, at a much lower rate of speed than the middle rollers would ordinarily do. If such is the case, then the quickly traveling front rollers will, in conjunction with the slow-traveling belt, cause the fibers seized in their nip to be quickly drawn forward, and very considerable drafting will take place.

A representative of one of the leading British firms of textile machinists has seen the system at work over an extended period, and his opinion is that the spinning is slightly better than the average spinning in Lancashire mills. Samples of yarn spun from Egyptian counts, 78s spun with a draft of 68, also yarn from American 27s with a draft of 36, have been submitted to experts in Bolton and have been found to be slightly more regular in counts, lea for lea, and stronger than average yarn of same counts spun from similar cotton in the usual manner here.—Manchester Guardian.

THE MANUFACTURE OF ARTIFICIAL SILK

An improved method of manufacturing artificial silk, invented in Holland, has recently been patented in this country, and is described by the inventor as follows: Previous attempts to produce from albuminous substances silk-like threads having similar qualities to the ordinary animal product have had but little success. The most comprehensive experiments in this connection have been on casein preparations and the product obtained was always hard and brittle, fine threads such as are necessary for the production of a good silk not being possible of production. A certain amount of flexibility could be given to the product by means of chemical additions such as glycerin or the like, but this is only at the cost of strength. Casein products cannot therefore be considered to have previously yielded really silk-like threads.

This invention is distinguished from the methods heretofore employed, in that it does not use casein as a starting material, but instead employs as a raw material the protein substances which remain in cows' milk after the same has been reacted on by salts of pyrophosphoric acid or pyrophosphates, and the casein precipitated thereby has been removed therefrom. The protein substances left in the whey after the removal of the casein thus precipitated, consist in lactalbumin and a derivative product of casein. These protein substances are then thrown out from the whey by means of such reagents as are ordinarily used in precipitating casein and albuminates. The product thus precipitated is then rendered plastic by the addition of a small amount of ammonia or other alkali, whereupon the same may be worked into the finest silk-like threads which are elastic, and which possess also great strength and great toughness, thereby adapting them in a marked degree for all purposes where silk is employed.

A solution of a pyrophosphoric salt is slowly added to milk, preferably skim milk, for example, to each 1,000 parts by weight of milk at least three parts of dry sodium pyrophosphate or the equivalent amount of another pyrophosphate. The milk curdles and forms at first into a jelly-like mass. After standing for a short time, especially in a heated condition, the solid materials separate sufficiently from the whey so that a separation of the two is possible. The albuminous substance in solution in the whey is separated by means of diluted acids or other known precipitating agents, and after the liquid present has been pressed out the product is converted into a tough plastic mass by adding a small amount of ammonia or other alkali.

If the material is to be made into threads the albumin precipitated out by the acids is first washed with water and again dissolved completely in diluted alkali lye, whereupon the solution is filtered and the product precipitated by dilute acids. The product purified in this manner is freed from moisture by pressing and then converted into the plastic form by means of ammonia or other alkali. This material which can be drawn out into the finest threads, is worked in the usual manner and hardened by the action of formaldehyde or other known hardening agent. This process which involves the treatment of the whey left after reaction on the milk with a salt of pyrophosphoric acid, quite a different precipitation from that which is usually carried out by means of acid, occurs in the milk. When a solution of such salt of pyrophosphoric acid is added to the milk, a voluminous precipitate is formed, the casein thrown down forming into a jelly-like mass. When this precipitate is separated from the fluid it will be found that the whey still contains the greater part of casein, but this casein has now assumed an altered form. The casein when precipitated by means of an acid assumes a flocky incoherent form, whereas when precipitated according to the improved method the casein assumes the form of a glutinous and stringy mass which can be drawn out into threads. The whey left after the removal of this precipitate contains lactalbumin and a derivative product of casein. This product has essentially different properties from the original casein. It contains no paracasein, a body which is always thrown down when ordinary milk is treated with rennet ferment and which is a characteristic product when casein of ordinary milk is treated with rennet ferment.

SLUMP IN LACE MAKING MACHINES

Editor Textile World Record:

I have read with interest your article in March issue entitled "Slump in Lace Making Machines." The notice is certainly some indication of the present state of the lace trade, but the following is a more correct interpretation: Most of the machines referred to are old machines and much narrower than the modern ones. The slackness of the lace trade these last three years or more has created a very keen competition and where there is such keen competition, these old machines, particularly those of ordinary gauge, are of no use whatever, as their output is not to be compared to modern machines. The old machines cost practically as much to work as the modern machines. There has been in fact a lot of old machines sold at scrap iron prices and replaced with up to date machines. As a matter of fact it does not pay to operate these out of date machines.—A. W. Buhlmann, representing Wallis & Longden of Long Eaton.

The hosiery industry of the United States had its beginning in Germantown, a part of Philadelphia, soon after Penn's arrival, in 1683. The Mennonites and other Germans from the Palatinate, who settled in or near Germantown, brought with them their crude frames and set them up in their homes. The men operated the frames while the women sold the stockings. They were made mainly of woolen yarn and sold for a price about equal to one or two dollars per pair in our money.

Personals

Ralph Bardsley has been appointed superintendent of weaving at the Barnaby Manufacturing Co., Fall River, Mass.

Dexter Stevens has accepted the position of superintendent of the Esmond Mill, Esmond, R. I., succeeding H. L. Crocker.

Thomas F. Connors, for the past ten years superintendent of the Pocasset Manufacturing Co., Fall River, Mass., has resigned.

S. B. Teste, superintendent of the Chenango Silk Co., Binghamton, N. Y., has resigned to accept a similar position with D. G. Dery at South Bethlehem, Pa.

Peter Bauer, superintendent of the Paragon Silk Mills, Paterson, N. J., has severed his connection with that company.

George Lyons has accepted the position of overseer of weaving at the Berkshire Mill No. 3, Adams, Mass., to succeed William Russell who has been placed in a new position in the cloth room.

C. L. Tarbox, overseer of spinning at the York Manufacturing Co., Saco, Me., for the past forty years, has retired from active service. He is succeeded by Thomas F. Carey.

John Cornell has accepted the position as overseer of dyeing at the George's River Mill, Warren, Me. He was formerly second hand at the Pondicherry Mill, Bridgton, Me.

Frank Towle, overseer of carding at the Fort Dummer Mills, Brattleboro, Vt., has resigned his position with that company. He is succeeded by Thomas Hennessey of Chester, Pa.

C. W. McKendrick has accepted the position of overseer of carding at the Amos, Abbott & Co., Dexter, Me. He comes from Clayville, N. Y.

Andrew Flynn has accepted the position as overseer of carding nights at the Amos, Abbot & Co., Dexter, Me.

Frank J. Allen has resigned his position at the D. G. Dery's Silk Mill, Scranton, Pa., owing to ill health.

Harry E. Houghton, overseer of carding at the Grosvenordale Co., North Grosvenordale, Conn., has resigned to accept the position as superintendent of the Dwight Manufacturing Co., Chicopee, Mass.

Alfred Wallwork has acepted the position of overseer of weaving at the Esmond Mill, Esmond, R. I., succeeding S. L. Deane.

K. J. Whalen, overseer of dyeing at the Huntington Manufacturing Co., Huntington, Mass., has severed his connection with that company.

J. W. Sands has accepted the position of overseer of finishing at the Franklin Mill, M. T. Stevens & Sons Co., Franklin, N. H. He was formerly employed at the Pontoosuc Mills, Pittsfield, Mass.

George W. Harrington has accepted the position of overseer of carding at the branch mill which the Pentucket Woolen Mills are starting up at Haverhill, Mass.

Louis Baker, for the past two years overseer of carding nights at the Fuld & Hatch Knitting Co., Cohoes, N. Y., has resigned his position with that company. The help presented him with a diamond stick pin.

W. F. Stegall, superintendent of the Arista Mills Co., Arista, N. C., has resigned his position with that company. He is succeeded by Edward Powers.

W. L. Robinson, superintendent of J. W. Cannon & Sons Mill, Concord, N. C., has resigned his position with that company.

F. A. Cumnock has been elected president and manager of the White City Manufacturing Co., Athens, Ga. He was formerly employed at the Humboldt Cotton Mills, Humboldt, Tenn.

John D. Moss has been elected president and treasurer of the Athens Manufacturing Co., Athens, Ga., succeeding the late T. P. Vincent.

John White, formerly designer at the Pawcatuck Woolen Mill, Westerly, R. I., is now designer at the Indian Spring Mill, American Woolen Co., Madison, Me.

Hugh Cameron has accepted the position of overseer of dyeing at the Pawtuxet Valley Dyeing Co., Phenix, R. I. He was formerly employed at the Richardson, Foster Co., Central Falls, R. I.

John M. Carney, foreman in the spinning department at the Cheney Bros. Silk Mill, South Manchester, Conn., finished fifty years of continuous service in the employ of this company April 2 and the event was officially recognized by the firm, they honoring him with a gift of $100 in gold. A solid gold watch, in which his initials and a suitable inscription are engraved, was given him by his fellow employes. In further recognition of the event a banquet attended by the heads of the firm was held in Hartford, Conn., April 2.

H. W. Owen, agent of the Pacific Mill, Cocheco Department, Dover, N. H., has tendered his resignation to accept the position of agent at the Bates Manufacturing Co., Lewiston, Me. Mr. Owen came to Dover as superintendent in 1901 and several years later he was appointed agent to succeed Charles H. Fish.

The Syndicate of Toronto gentlemen, who are reorganizing the Dominion Linen Manufacturing Co., at Guelph, Ontario, Canada, offered the

managership of the reconstructed company to A. F. MacIntyre of Niagara Falls, but he preferred to go on with the new company at Niagara Falls, Canada, as he considered it offered better conditions and facilities. Mr. MacIntyre is very well known in the textile business on both sides of the Atlantic.

Robert J. Belcher, for a number of years employed at the Corr Manufacturing Co., Taunton, Mass., and for the past few years its superintendent, has been appointed superintendent of the Pocasset Manufacturing Co., Fall River, Mass., to succeed Thomas F. Connors.

Charles R. Thomson, general superintendent of the Renfrew Manufacturing Co., Adams, Mass., for the past eleven years, has severed his connection with that company.

John Beck, overseer of weaving at Joseph Benn & Sons, Inc., Greystone, R. I., since its organization, has resigned his position with that company on account of ill health. For the present Christopher Beanland will be in charge of the weaving department.

Fred Wilkes, Jr., formerly designer at the Perseverance Worsted Co., Woonsocket, R. I., has been appointed assistant superintendent to succeed Leeming Rhodes. Ellington Wade will succeed Fred Wilkes as designer.

Ralph Dunford has been promoted to the position of overseer of weaving at the Perseverance Worsted Co., Woonsocket, R. I.

J. Ogden has accepted the position of overseer of spinning at the Philadelphia Felt Co., Frankford, Philadelphia, Pa.

C. H. Gibb has accepted the position of overseer of dyeing at the Cambria Silk Hosiery Co., Philadelphia, Pa. He comes from Chester, Pa.

F. P. Gallagher has been appointed overseer of finishing at the Somerset Woolen Co., Monson, Mass., succeeding John Heaton. Mr. Gallagher comes from Providence, R. I.

Otto Ruhlin has accepted the position of overseer of finishing at the Hadley Mill, South Hadley Falls, Mass. He was formerly employed at the Lawrence Dye Works, Lawrence, Mass., and succeeds Thomas W. Biddles.

Elwood Ward has been appointed assistant superintendent for the H. W. Johns-Manville Co., Manville, N. J. He has held the position as overseer of weaving at the Locustville Woolen Co., Hope Valley, R. I., the Malone Woolen Mills, Malone, N. Y., American Felt Co., Glenville, Conn., and the Woolen Manufacturing Co., Beaver Dam, Wis.

William P. Simon, overseer of finishing at the Saxton's River Woolen Co., Saxton's River, Vt., has severed his connection with that company.

John R. Simpson, overseer of dyeing at the Beoli Mill, Fitchburg, Mass., has resigned his position with that company.

Frank Lynch has accepted the position of overseer of the aniline black dyeing at the Garner Print Works & Bleachery, Wappinger's Falls, N. Y.

A. D. Stallings has accepted the position of overseer of finishing and boarding at the Elizabeth City Hosiery Co., Elizabeth City, N. C. He comes from Portsmouth, Va.

J. P. Curlee has been appointed superintendent of the Erwin Mill No. 3, Cooleemee, N. C.

G. A. Polatty has been appointed superintendent of the Jackson Mill, Monroe, N. C., to succeed E. W. Edwards. For the past few years he has been superintendent of the Tarboro Cotton Mill, Tarboro, N. C.

J. D. Hollingsworth has accepted the position of overseer of carding at the Marlboro Mills, McColl, S. C.

O. L. Derrick has been appointed superintendent of the Harriss Manufacturing Co., Rock Hill, S. C.

J. H. Neal has been appointed superintendent of the Worth Manufacturing Co., Harding, N. C. He was formerly employed at the Phoenix Mill, King's Mountain, N. C.

Joseph Auclair has accepted the position of overseer of spinning at the Coronet Worsted Co., Mapleville, R. I., succeeding George H. Pearce. Mr. Pearce has been overseer of spinning at this mill for over forty years, fourteen years with the Coronet Worsted Co. and twenty-six years with James Legg & Co.

Stewart D. Fisher, for the past nine years overseer of the silk department at the Paul Whitin Manufacturing Co., Northbridge, Mass., has severed his connection with that company. He is succeeded by Carl C. Dudley, formerly second hand in that department.

Fred Crook has accepted the position of overseer of weaving nights at the Oak Valley Mills, Tarkiln, R. I. He comes from Nasonville, R. I.

Irving Southworth has been appointed general superintendent of the Cocheco Department of the Pacific Mill, Dover, N. H., to succeed H. W. Owen.

Edwin F. Hitchcock, Jr., for over twenty years superintendent of the New England Knitting Co., Winsted, Conn., has resigned his position with that company.

W. T. Lockett, agent of the Garland Woolen Co., Staffordville, Conn., has resigned his position with that company.

Henry McCusker, agent of the Garner Print Works & Bleachery, Wappinger's Falls, N. Y., has tendered his resignation to take effect May 1. He is succeeded by Charles E. Meader of Lowell, Mass.

Howard E. Thynge has been appointed superintendent of the Jefferson Mills, Chester, Pa. Mr. Thynge was formerly employed at the Attawaugan Co., Danielson, Conn.

B. E. Connell has been promoted to the position of assistant superintendent at the Darling

Woolen Mill Co., Holliston, Mass. He formerly held the position of overseer of weaving at this mill.

Leo J. Shindler has accepted the position of overseer of weaving at the Darling Woolen Mill Co., Holliston, Mass. He comes from Staffordville, Conn.

James Rennie has accepted the position of overseer of dressing at the Ardmore Mill, Yantic, Conn.

Albert E. Riley has accepted the position of overseer of dyeing at the Huntington Manufacturing Co., Huntington, Mass. He has just returned from England where he had been for over three months.

J. T. Hanton, overseer of the preparation department at the Manhasset Manufacturing Co., Putnam, Conn., has resigned to enter the employ of the Jenckes Spinning Co., Pawtucket, R. I.

Charles H. Gardner, overseer of carding at the Manomet Mill No. 2, New Bedford, Mass., has resigned and is succeeded by Frank C. Knight.

Alfred Parkinson, for the past six years overseer of weaving at the Greylock Mill, North Adams, Mass., has resigned his position with that company.

Frank P. Shayer, overseer of weaving at the Montrose Woolen Co., Woonsocket, R. I., has resigned his position with that company.

Richard Murray has accepted the position of overseer of weaving at the Border City No. 3 Mill, Fall River, Mass., to succeed Edward Hacking.

Benjamin Pigott, for eight years overseer of the cloth department at the Parker Mill, Fall River, Mass., has resigned. He was presented with a beautiful silver shaving set by the help in his department.

Paul F. Estey, employed at the American Thread Co., Willimantic, Conn., as chemist, has resigned to accept a position with the Bradford Dyeing Association, Bradford, R. I.

Charles H. Hanson, for the past thirty-four years master mechanic at the York Manufacturing Co., Saco, Me., has severed his connection with that company. He is succeeded by Albert Gaines.

Henry Plouffe, overseer of weaving at the Clinton Manufacturing Co., Woonsocket, R. I., has severed his connection with that company. Mr. Plouffe has been employed at this company for the past twenty-one years. He worked up from weaver to loom-fixer and then overseer of weaving.

Bernard D. Connell has accepted the position of overseer of carding at the R. T. Sullivan & Company's Mill, Newton Lower Falls, Mass.

John J. Casey has accepted the position of overseer of carding and spinning at the National Knitting Co., Milwaukee, Wis.

John Witts, second hand in the carding department at the No. 1 Tecumseh Mill, Fall River, Mass., has resigned on account of ill health.

E. W. Edwards has resigned as superintendent of the Jackson Mills Co., formerly the Monroe Cotton Mills, Monroe, N. C. He is succeeded by G. A. Golatty, formerly of the Tarboro Cotton Factory, Tarboro, N. C.

R. R. Woodside has accepted the position of overseer of weaving at the Watts Mill, Laurens, S. C. He was formerly employed at the Judson Mill, Greenville, S. C.

Enoch Greenwood has been appointed chief executive of the Ashtabula Worsted Mill, Ashtabula, O. He was formerly employed at the Empire Worsted Mill at Jamestown, N. Y.

Charles Morton has been appointed superintendent of the Greylock Mill No. 5, Williamstown, Mass. He was formerly employed as superintendent of the Clinton Manufacturing Co., Woonsocket, R. I.

S. M. Lambert has reentered the employ of the Garland Woolen Co., Staffordville, Conn., as superintendent succeeding William T. Lockett.

George Messmer has been elected superintendent of the Dery Silk Mill, East Mauch Chunk, Pa., to succeed Conrad Gossweiler.

Edward Graham has been appointed assistant designer at Strong Hewat & Co.'s Mill, North Adams, Mass., succeeding Wm. Boyd, who has gone to the North Adams Manufacturing Co., North Adams, Mass., as designer.

William R. Elliott has been appointed chief clerk at the American Woolen Co.'s Mill at Skowhegan, Me.

Ernest Rayner has been appointed designer at the Arms Mill, American Woolen Co., Skowhegan, Me.

Siegmund Berger has accepted the position of designer at the Continental Worsted Co., Providence, R. I.

Thomas A. Grieve has accepted the position of designer at the Pawcatuck Woolen Co., Potter Hill, R. I. He was formerly employed at the Manton Mill, American Woolen Co., Manton, R. I.

Lawrence H. Love has accepted the position of overseer of weaving at the Montrose Woolen Co., Woonsocket, R. I.

Gustav Weder, overseer of carding with Benjamin Hey & Co., Cincinnati, O., has resigned his position with that company.

J. W. Sands has accepted the position of overseer of finishing at the Franklin Mills, Franklin, N. H. He comes from Pittsfield, Mass.

Joseph Dalton has accepted the position as foreman of the knitting at the Mishawaka Woolen Manufacturing Co., Mishawaka, Ind.

J. E. Rochette has accepted the position of overseer of weaving at the Chicopee Manufacturing Co., Chicopee Falls, Mass. He was formerly employed at the Tremont & Suffolk Mill, Lowell, Mass.

Michael J. Kennedy, for the past ten years second hand of the weaving department at the Globe Mill, Woonsocket, R. I., has resigned to accept a position as overseer of weaving at the Clinton Manufacturing Co., Woonsocket.

W. E. Batty, son of W. J. Batty, president of the Pawcatuck Woolen Mill, Potter Hill, R. I., has entered the employ of this company and has taken up his duties at the mill at Potter Hill.

Eli Hall has been promoted to the position of overseer of dyeing at the Waucantuck Mill, Uxbridge, Mass. He formerly held the position of second hand.

J. H. Neal has been appointed superintendent of the Harden Manufacturing Co., Worth, N. C.

William P. Cargill has accepted the position of overseer of spinning at the Wylie Mill, Chester, S. C.

W. E. Holmes has accepted the position of overseer of spinning at the Henderson Cotton Mills, Henderson, N. C.

N. H. McGuire has accepted the position of overseer of weaving at the Seneca Cotton Mill, Seneca, S. C. He was formerly employed at the Eureka Mill, Chester, S. C.

J. J. McCrary has accepted the position of assistant superintendent of the Brogon Mill, Anderson, S. C. He was formerly employed at the Otis Co., Ware, Mass.

F. A. Cumnock has been elected president and manager of the White City Mill, Athens, Ga.

R. L. Sullivan has accepted the position of overseer of spinning at the E. A. Smith Manufacturing Co., Rhodhiss, N. C.

C. L. Taylor has accepted the position of overseer of spinning at the Clifton Mill No. 3, Converse, S. C. He was formerly employed at the Riverside Mills, Anderson, S. C.

W. L. Finlayson has been promoted to the position of overseer of weaving at the Monticello Cotton Mills, Monticello, Ark.

A. W. Mungall has accepted the position of overseer of dyeing at the Hamilton Carhartt Mills, Rock Hill, S. C.

George A. Shea has been appointed superintendent of the E. A. Smith Manufacturing Co., Rhodhiss, N. C.

O. Johnson has accepted the position of overseer of dyeing at the Beaumont Mills, Spartanburg, S. C. He was formerly employed at the Hamilton Carhartt Mills, Rock Hill, S. C.

G. G. Allen has been appointed superintendent of the Dresden Mills, Lumberton, N. C.

H. O. Davidson has been appointed superintendent of the Eagle & Phenix Mills, Columbus, Ga. He was formerly employed at the Woodstock Mills, Anniston, Ala.

Andrew Hainey, for the past nine years master mechanic at the William H. Haskell Manufacturing Co., Pawtucket, R. I., has resigned his position with that company.

John R. Watson, head chemist at the Princeton Worsted Mill, Trenton, N. J., has resigned to accept a position with the Harris, Continental Dye Works, Philadelphia, Pa.

Timothy E. Moore has accepted the position of overseer of carding and spinning at the Saxton's River Woolen Co., Saxton's River, Vt. He was formerly employed at the Contoocook Mills, Hillsboro, N. H.

P. F. Hanlin, overseer of finishing at the Raritan Woolen Mills, Raritan, N. J., has resigned his position with that company. He is succeeded by Steven Thompson, who was overseer of finishing at the Wakefield Mill, Wakefield, R. I.

George F. Edson has accepted the position of overseer of finishing at the French River Textile Co., Mechanicsville, Conn. He was formerly employed at the Rockville Worsted Co., Rockville, Conn.

Christopher Patten, overseer of spinning at the A. D. Carter Mill, Tilton, N. H., and Miss Alice Dow, a well known young lady of Tilton, were united in marriage by Rev. Fr. A. Sylvester of Tilton. They were attended by Mr. and Mrs. Louis Brooks of Ashland, N. H. Mr. Patten was presented with a handsome easy chair by the help in his employ, the presentation being made by John Gregory. Mr. and Mrs. Patten will take up their home in Tilton after a short wedding trip.

Richard H. Fish, overseer of weaving and assistant superintendent at the Barnard Manufacturing Co., Fall River, Mass., has resigned his position with that company.

Charles L. Danielson has been appointed general manager of the N. E. Cotton Yarn Co. with mills at New Bedford, Fall River and Taunton, Mass. Mr. Danielson was assistant manager of the N. E. Cotton Yarn Co.'s mill at Fall River and is succeeding John B. Strongman.

DEATHS.

Cyril Johnson, one of the best known woolen manufacturers in New England, died at his home in Stafford Springs, Conn., after a short illness at the age of 82 years. Mr. Johnson began manufacturing several years ago in what is known as the Stafford Hollow Mill. He afterwards bought the Cyril Johnson Co. at Stafford Springs. He was a director of the First National Bank and was conspicuous in charitable work, having founded the hospital which bears his name and is a memorial to himself and wife. Mr. Johnson had a wide circle of relatives and friends and is survived by his wife.

James A. Dresser, for thirty-five years an overseer at the Pepperell Manufacturing Co., Biddeford, Me., died at his home in that city. He was born in Lowell, Mass., Oct. 16, 1844, and is survived by a widow.

Charles L. Macomber, president of the Winthrop Cotton Yarn Co., and the Taunton Knitting

Mill, both of Taunton, Mass., died April 1 after a short illness at his home in Taunton. He was a member of the King David Lodge, A. F. & A. M., St. Mark's Royal Arch Chapter, St. John's Commandery K. T., and the Palestine Temple Order of the Mystic Shrine of Providence. His wife, one daughter and two sisters survive him.

Paul C. Bochmann, treasurer of F. A. Bochmann & Co., woolen manufacturers at Philadelphia, Pa., with New York office at 254 Fourth Ave., died recently at St. Luke's Hospital, New York City. The body will be shipped to Saxony, where Mr. Bochmann was born, for burial.

James Harden, well known in this country and in Ireland as a linen manufacturer and president of the Acheson Harden Company, died April 6 at the German Hospital, New York City, following an operation for gall stones. He was the son of Acheson Harden, who founded the Acheson Harden Co., a linen firm, in the North of Ireland, sixty years ago. Mr. Harden was a member of the Merchants' Association, the Chamber of Commerce and the Merchants' Club. His wife, two daughters and four sons survive him.

George T. Jones, a civil war veteran, for thirty-two years master mechanic at the Boston Manufacturing Company's Cotton Mill at Waltham, Mass., and who has held several public offices in Waltham, died at his home in that city April 6 at the age of 72 years. He had been ill with pneumonia, but heart failure was the immediate cause of death. His widow and a son survive him.

Elliott C. Lambert died April 8 in Manchester, N. H., at the home of his brother, Dr. Samuel W. Lambert. Mr. Lambert was born in Manchester, May 9, 1863. In 1886 he went into the Willimantic Thread Co. and later he began work in the mills of the Amoskeag Manufacturing Co., working his way up to the position of superintendent of the cotton department. He was with this company for nineteen years. His widow survives him.

Levy Strauss, president of the Textile Manufacturing Co., Champaign, Ill., died at the age of 65 years. He was a resident of Chicago for forty-five years until they moved their knitting plant to Champaign. Three children survive him.

William J. Tingue, president of the Tingue Manufacturing Co., Seymour, Conn., with New York office at 118 East 25th St., died April 2, at his home in New York City at the age of 78 years. He had been engaged in mercantile enterprises for over fifty years and commanded the respect of a large number of business friends and associates A number of years ago he organized and became president of the American Felt Co., but later centered his entire interests with the Tingue Manufacturing Co. His widow and two sons survive him.

William McKenzie, owner of the Standard Bleachery Co., Carlton Hill, N. J., died at his home in East Rutherford, N. J., at the age of 73 years. His widow, one daughter and four sons survive him.

Rugene Walrath, president and treasurer of the Walrath Co., manufacturers of men's ribbed underwear and sweater coats, Little Falls, N. Y., died in that city after a short illness. In 1883 Mr. Walrath was made president of the Little Falls Knitting Co. Years afterward he took over the business and changed the name of the company. He was one of the best known manufacturers of knit goods in that section of the country.

EBEN SUMNER DRAPER

Hon. Eben Sumner Draper, General Agent of the Draper Company of Hopedale, Mass., twice Governor of the State of Massachusetts, died at Hotel Ottaray, Greenville, S. C., Thursday afternoon, April 9th, having been stricken with paralysis. He was surrounded by his brother, George Alfred Draper and his two sons, B. H. Bristow and Eben S., Jr., who were summoned to his bedside.

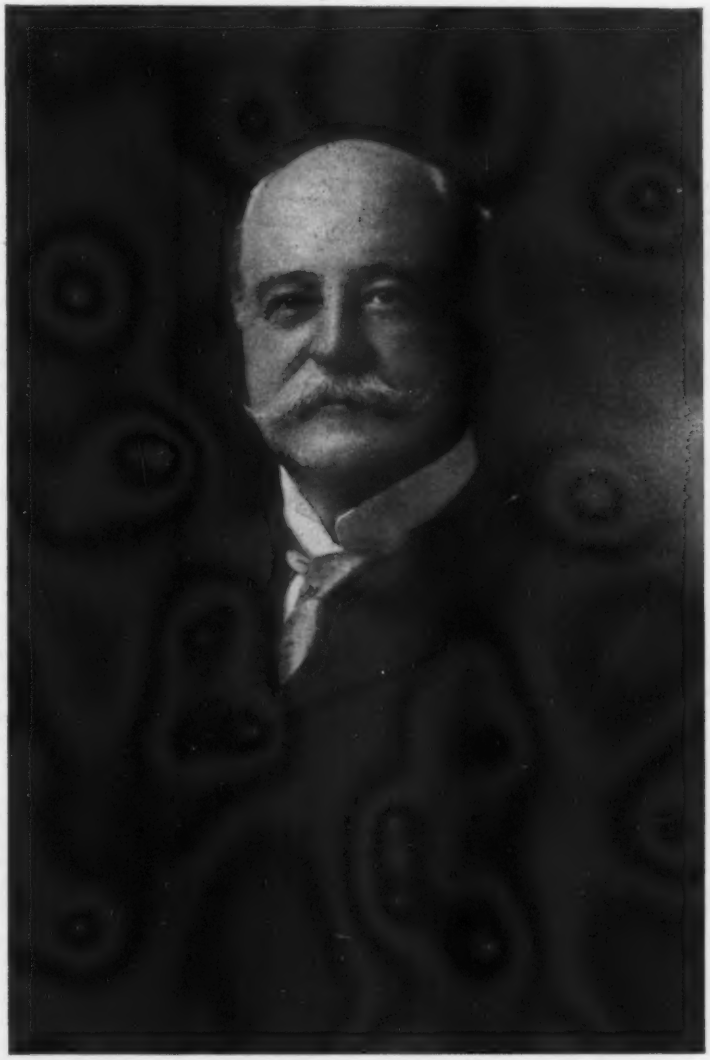
Gov. Draper was one of the most widely known men in the textile trade and was held in the highest esteem by all who were fortunate enough to know him. He was a recognized leader both in politics and business. He served his state fearlessly and conscientiously as its chief executive for two terms, 1908 and 1909 and during that service had many opportunities to display wonderful executive ability. He was one of the founders of the Home Market Club and one of the first board of directors. His interests were large and diversified. Throughout his life he always had wide business interests other than those directly connected with the Draper Company at Hopedale. He was associated with the Hopedale Machine Company, the Dutcher-Temple Company, the Hopedale Screw Machine Company, the Globe Yarn Mills, the Continental Mills, Lewiston, and the Glasgow Thread Company.

He served as vice-president of the Manville Company, was director of the Milford National Bank, the Queen City Cotton Company of Vermont and the Sawyer Spindle Company of Maine. His intense interest and liberality both in purse and labor in charitable works will stand as a perpetual monument to his memory.

Eben Sumner Draper was the youngest son of George William and Hannah Brown (Thwing) Draper, and was born June 17, 1858, in that part of the town of Milford which is now known as Hopedale. His early education was obtained in the public schools of his native town and at Allen's school at West Newton. He was of the third generation of a noted family of industrial leaders, his grandfather, Ira Draper, having founded the business which later became the Draper Company in the early part of the last century.

At the age of 16 years he entered the Massachusetts Institute of Technology to take up a course in mechanical engineering which was planned to fit him for his future career as a manufacturer and seller of machinery for the making of textile fabrics. He was graduated in the class of 1880 and always retained an active interest in

the Massachusetts Institute of Technology and was for a number of years a member of its corporation. He at once set to work to supplement his technical education by the practical experience of work. His training was thorough.



EBEN S. DRAPER

By the time he had proven that he knew the business he was admitted into partnership in the firm of George Draper & Sons, which then consisted of his father and two brothers, Gen. W. F. and G. A. Draper, and in 1896, when the Draper Company was formed, became its selling agent. A Unitarian in religion, he was elected some years ago vice-president of the American Unitarian Association. He was a member of the Society of Colonial Wars, the Metropolitan Club of New York, the Hope Club of Providence and the Somerset, Algonquin, Union, Middlesex and Massachusetts Clubs of Boston.

Mr. Draper was married in 1883 to Miss Nannie Bristow, daughter of Gen. Benjamin H. Bristow, former secretary of the treasury, who died about a year ago. Three children were born to the Drapers—B. H. Bristow, Eben S., Jr., and Dorothy, who still survive.

Of him it can truly be said, "He was an honorable man."

The funeral will be held at Hopedale, Mass., Tuesday afternoon, April 14th.

New Publications

Any work noticed under this heading can be obtained, postage or express charges free, by sending the price listed to Lord & Nagle Company, 144 Congress St., Boston, Mass. A catalogue of textile books in the English language will be sent free on application.

Cotton Spinners and Manufacturers' Directory of Lancashire; John Worrall, Ltd., Oldham, England. Price $2.50.

We have received a copy of the 1914 edition of this well known directory which gives a list of the cotton and weaving mills of Lancashire with particulars regarding the organization, the amount of machinery operated and class of goods made by each establishment. It has been carefully revised to correspond with the present state of the industry. As the cotton manufacturing industry of Great Britain centers in Lancashire, this is practically a cotton mill directory for England.

Textile Materials under the Microscope (Textiltechnische Untersuchungsmethoden); by Dr. Wilhelm Massot, professor of dyeing and finishing at Krefeld; 98 pages, 4 by 6; G. J. Goeschen'sche Verlagshandlung, Berlin, Germany. Price 50 cents.

The author begins this handbook with a brief account of the microscope itself. This is followed by directions for using the instrument and the preparations of the objects. The second part of the volume treats of textile materials under the microscope, including vegetable and animal fibers and artificial filaments. The book is freely illustrated with excellent drawings and the contents are systematically arranged, making it a very useful and convenient handbook for those engaged in the microscopical examination of textile materials. The text is in German.

Worsted Preparing and Spinning (Wool Combing); by Fred Bradbury; 539 pages, 5 by 7, volume 2; F. King & Sons, Ltd., Halifax, England. Price $1.50.

The first volume of this work was written by Mr. Bradbury and M. M. Buckley. Owing to the death of Mr. Buckley, Mr. Bradbury was engaged to write the second volume, which has recently been published. The contents are arranged under the following heads: Intermediate Processes between Carding and Combing; Wool Combing; The Noble Comb; The Modern Noble Comb; Feeding the Noble Comb; Dabbing Mechanisms; Drawing-off Mechanisms; Sliver Funnels, Can Coiler, Circle Cleaning and Stop Motion; The Set Over and Theory of Pinnings; Cooper's Noble Comb; The Nip or Lister Comb; The Square Motion or Holden's Comb; The Heilman Comb; Finishing Gill Boxes; Miscellaneous Problems. The book is freely illustrated. The explanations are clear and special effort has been made to include a description of all of the recent improvements in processes and machinery for preparing and spinning worsted.

The Printing of Textile Goods (Bedrucken von Textilstoffen); by H. Silbermann; 310 pages, 5 1/2 by 8 1/2; Dr. Max Jaenecke, Leipzig, Germany.

This volume consists of a compilation of German patents relating to textile printing, which have been issued during the past twelve years. The patents are classified under the following heads: A, machine for printing sliver and yarn; B, Machines for printing knit goods; C, Machines for printing piece goods and tapestry. The volume contains numerous illustrations taken from the patent drawings and will doubtless be of much value to those desiring to investigate the development of textile printing. The text is in German.

Cotton (Die Baumwolle); by Carl Steuckart; 59 pages, 7 by 10 1/2; Bernh. Friedr. Voigt, Leipzig, Germany. Price $1.25.

This study of the raw cotton trade is arranged under the following heads: 1, The Economic Importance of Cotton; 2, The Cotton Plant; 3, The Principal Cotton Producing Countries; 4, Recent Efforts to Solve the Cotton Question. The volume, which is freely illustrated, is the outcome of the German efforts to obtain a supply of cotton outside of the United States. The text is in German.

Printing of Textiles (Der Zeugdruck); by Carl Steuchart; 63 pages, 7 by 10 1/2; Verlag von Bernh. Friedr. Voigt, Leipzig, Germany. Price $1.25.

This volume deals with the chemistry and mechanical operations of textile printing, the contents being arranged under the following heads: 1, Dyeing and Dyestuffs; 2, Decorating Goods by Dyeing and Painting; 3, The History of Textile Printing; 4, Hand, Block and Roller Printing; 5, Accessory Machines for Printing Textiles; Shearing, Singeing, Scouring Machines, Squeezing, Drying, Oxidizing, Steaming, Calendering, Softening and Fulling Machines; 6, Designing Patterns. The text is in German.

Cotton Spinning and Weaving (Die Baumwoll-Spinnerei und Weberei); by Dr. Ing. Gustav Baum; 175 pages, 7 by 10; Verlag von M. Krayn, Berlin, W., Germany. Price $1.25.

This volume deals mainly with the construction and installation of machinery used in cotton spinning and weaving, the contents being arranged under the following heads: The raw materials, natural and artificial, of textile manufacturing; Historical sketch of spinning and weaving; Mill construction; Machinery construction; Statistical. The text, which is freely illustrated, is in German.

Mason Regulating Appliances; The Mason Regulator Co., Boston, Mass.

This is a catalogue of 216 pages, 4 by 6 1/2, making a compact volume, in which are described and illustrated the large number of regulating appliances comprising the products of this company. The contents are arranged in an unusually convenient and attractive manner, enabling quick reference to any appliance desired, even without the aid of the index.

BUSINESS LITERATURE

The Franklin Process System of Dyeing Yarns; The Franklin Process Co., Providence, R. I.

An illustrated catalogue describing and illustrating the Franklin process of dyeing yarns has just been issued by this company. The yarn is first wound on springs which can be compressed without injuring the wound package. The yarns being dyed in the compressed condition are dyed uniformly since the column of yarn always has the same density and the liquor is pumped through at the same rate and through all parts of the package. The machine used is very simple in construction, consisting of a kier, holders for yarn packages, an expansion tank for feeding in the various solutions, a pump and piping. There are no complicated parts and nothing to wear out. We would suggest those interested to write for a copy of this booklet, using the key "C" when doing so.

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Circular Knitting Machinery; The Leighton Machine Co., Manchester, N. H.

An elaborate catalogue describing and illustrating the various knitting machines built by this concern. The improved automatic rack and stripe sweater machine, the pattern chain motion for racking machines, the automatic rack seamless sleever, shaker sweater machine, seamless racked edge shaker cuff machine, the plain sweater machine, and the underwear machine are all described and illustrated. There is also included in this pamphlet a list of sizes and standard cuts per inch for needles for use in the Leighton rib knitting machines.

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S.K.F.Ball Bearings in Textile Mills; The S.K.F. Ball Bearing Co., 50 Church St., New York City.

A forty-eight page, handsomely illustrated catalogue will appeal to textile manufacturers because it describes and illustrates the direct application of the S.K.F. Ball Bearings to different kinds of textile machines and for different purposes in textile mills. The general advantages of these ball bearings in textile mills, as a strictly dollars and cents saving proposition, are set forth in a forcible manner showing actual results. Different machines are taken up and the particular places where the ball bearings can be used to advantage are pointed out and pictures shown. Cotton openers and lappers are given one section. Rag and shoddy pickers, mixing pickers and lumpers receive special attention and illustrations are shown of the ball bearing boxes which have been adopted for this purpose. A test made in one mill showed a saving in power on two shoddy pickers equivalent to $350.00 per machine annually. Several shoddy picker manufacturers are using these ball bearings on the new machines they are putting out because it has been found that not only is the power consumption reduced, but the production per machine is increased to a surprising extent. Cotton cards, spinning and twisting frames, stock and yarn dryers, slashers and looms are other machines which are described at length in connection with the use of S.K.F. ball bearings. The garnet machine is a striking illustration of savings that have been made and increase in production. In one large mill, operating eleven four-cylinder garnet machines, equipped with 100 sets of S.K.F. ball bearings it was found that they were getting a larger production as well as getting stock which was absolutely clean, due to the fact that there was no oil dropping from the ball bearings. These machines were used for opening clipped and hard wastes preparatory to spinning. The power bill was reduced 50 per cent. This, together with the saving on belting, amounted to nearly $200.00 per month on the eleven machines. An application of S.K.F. ball bearings which has met with marked success is in connection with the worker rolls and main cylinders of napping machines. Here the self aligning feature is very important, reducing the wear and saving the power and operating cost. Fulling mills, cloth washers, scutchers, cloth expanders, shearing machines, motors are other subjects which are discussed in this very interesting and useful catalogue which was prepared with particular reference to the Textile Exhibition, where the S.K.F. Company had a large exhibit. Those who did not receive one at that time should send for a copy.

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The Kissel Motor Car Company of Hartford, Wis., has just issued a new motor truck book containing more than 350 illustrations of various KisselKar truck models in service. Looking over this publication for the first time, many will realize more than before what an important figure in transportation the truck is getting to be.

There is scarcely a line of business that doesn't use trucks, and this new KisselKar book doesn't merely say so, but proves it by the photographs of trucks in actual use.

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The Graton & Knight Mfg. Co., Worcester, Mass., have just issued an 114-page catalogue which illustrates and describes all their various brands of leather belting, lace leather, belt cement and dressing. It also includes valuable mechanical rules, tables, suggestions for the proper care of belting, for ordering belting, for securing the best belt for special conditions and many other technical features which will prove helpful to all buyers and users of belting.

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The Cassella Color Company, New York, has just issued a new supplement to their well-known book on cotton dyeing, descriptive of two interesting dyestuffs, viz., Diamine Fast Scarlet L 4 G and Diamine Fast Scarlet L 3 B Patd. These dyestuffs produce full, deep Scarlet shades upon cotton and union goods and are distinguished by their excellent fastness to light and ironing. These dyestuffs are particularly interesting on account of their brilliancy and which will enable designers of cotton textiles to make use of the shades in combination with other contrasting effects in the production of wide lines of novelty goods.

COLOR CARDS

Hydron Colors on Cotton Yarn. The Cassella Color Company, New York.

A color card which, without doubt, will prove of great value to dyers of fast colors upon cotton yarn. The volume contains a series of considerably over 100 dyeings, each of ample size to permit intelligent judging and comparison of shades against each other, and the description of the technical process is sufficiently full to enable the practical dyer to master the simple part of applying colors of such fastness to cotton. Besides detailing the methods for dissolving the colors and dyes, there are also a number of valuable suggestions regarding the method of producing combinations with these colors with the object of producing compounds or mode shades and including the employment of iron, mordants, saddenings for Hydron shades, perborate and other treatments, together with an interesting section on the use of the Hydron colors for machine dyeing.

A copy of this volume should be in the hands of every cotton dyer, and can be had on application.

Industrial Notes

THE G. M. PARKS CO.

Albert W. Thompson, the inventor of the Turbo Humidifier, has become actively identified with The G. M. Parks Company, of Fitchburg, Mass. Mr. Thompson will act in the engineering department which is becoming more and more a factor in The G. M. Parks Company's work, and his shop and textile experience will make his engineering knowledge particularly valuable.

Mr. Thompson was graduated from the Massachusetts Institute of Technology in the Class of 1896. He joined the staff of the Amoskeag Company, was promoted to the position of mechanical superintendent, having in charge the machine shop and machine problems about the mill. Later he became superintendent of the Saco-Lowell Machine Shops at Lowell and comes from them to the staff of The G. M. Parks Company.

FRANK J. HALE

Frank J. Hale, selling agent of the Saco-Lowell Shops, has been appointed by Governor Walsh to the Board of Trustees of the General Insurance Guarantee Fund. This is the commission which has general supervision of the affairs of savings bank insurance in Massachusetts. Mr. Hale has been interested in savings bank insurance from the beginning. Life insurance is issued in units of $500.00 and less and old age insurance can be taken out in units of $200.00 and less. Already there are in Massachusetts more than 8,500 policy holders. There are now sixteen savings banks in Massachusetts which act as public agencies for savings insurance banks.

THE GASTONIA CHAMBER OF COMMERCE

Gastonia, N. C., has recently organized a Chamber of Commerce for the purpose of booming the industries of that manufacturing center and pointing out its advantages for new industries. Gastonia has within its corporate limits seventeen cotton mills and Gaston County, of which Gastonia is the county seat and commercial center, contains sixty-four cotton yarn mills with 478,934 spindles. While the activities of the Gastonia Chamber of Commerce will be centered on the textile industries, other branches of trade will not be lost sight of.

FRENCH SPINNING AND WEAVING SCHOOL

The spinning and weaving school of eastern France (Ecole de Filature et de Tissage de l'Est) opens for the fall course on October 2. The normal course of studies consists of one year in the spinning department and one year in weaving. Students who have fitted themselves for it can take both courses simultaneously, the minimum age for admission being seventeen years. The tuition is 600 francs ($120) for one course, spinning or weaving, and 1,000 francs ($200) for both courses. The school is well equipped with English, American and Continental machinery and the Director solicits correspondence from prospective students from America. Address X. Hugueny, Director, Ecole de Filature et de Tissage de l'Est. Epinal (Vosges), France.

SEARCHING FOR A NAME

The Silk Association (of Great Britain) believes itself to have practically exterminated the false use of the name "silk" upon goods made from artificial fiber. The opinion may be justified as regards retailers, but hardly so among manufacturers, merchants, and others who continue to talk and to write of "art silk" habitually when "artificial" is intended, and from this frailty, members even of the genuine silk trade are not free. The invention of a suitable name to describe the cellulose silks continues to engage the attention of the ingenious, without, however, producing anything remarkably happy in the way of results. A paragraphist in a Bradford paper suggests "silkine," only to add that the name obviously would not serve any better than the now forgotten "butterine." It will seem that Sir George Birdwood's suggested names, despite their classicism, would really do no better. "Blastesis," the Greek for vegetation, lacks the attractive quality that is expected in names intended to assist sales; and "phytosericon," meaning leaf, vegetable or plant silk, is rather for the museum than the shop. The third venture, "sericine," is considerably too close to the more learned name for the gum existent in natural silk, and absent from the cellulose article. —The Dyer and Calico Printer.

The Cora Cotton Mills, King's Mountain, N. C., will place in operation electric drive equipment comprising six motors ranging from 40 h. p. to 125 h. p., two 15 kv-a. transformers and a switchboard. The apparatus will be furnished by the General Electric Company.

INTERIOR PAINTING IN TEXTILE MILLS

By THOMAS K. CHAFFEE, Providence, R. I.

Paint efficiency is perhaps a new idea to the average machine manufacturer. Yet efficiency is just as important in this detail of factory equipment as in all others. The old idea was "any old kind of paint" will do for the shop interior. As long as ceilings and walls were covered with something that looked white, whitewash or cold-water paint, as the case might be, the conditions were fully met in the minds of many shop managers.

That this is a wrong attitude is so obvious that argument is unnecessary. The manufacturer who will spend many dollars and much personal effort on modern factory construction or on intelligent reconstruction of his old plant, to gain better natural or improved artificial light, must also see the necessity of a proper interior, light-diffusing and reflecting surface. How can this be obtained at a comparatively low cost and with a high degree of efficiency?

The answer is easy. A suitable white paint must be used. This must give a practically impervious and imperishable coating, having a maximum light-reflecting and light-diffusing property in its surface. It must flow smoothly and evenly from an ordinary brush without "pulling" or leaving brush marks, so that the cost of applying will be reduced to a minimum. Dirt and dust must not adhere to it and with vibration and the deflecting of surfaces under load, the coating must not chip or "craze." As a rule, a hard enameled surface with a high gloss is preferred, although some shop managers recommend a partial gloss or eggshell finish.

The above specifications are by no means unduly severe, for they can be met by mill paints that have been on the market for a number of years.

Many manufacturers imagine that it is difficult to paint oil-soaked ceilings and dirty walls, and obtain satisfactory results. This idea is strengthened by noticing the manner in which some cold-water paints are driven off the underside of a floor that is oil soaked; but our experience has shown that it is by no means difficult to put such surfaces in first-class condition. If a coat of thinned-down orange shellac (which is cheaper than paint) is applied over the oil spots, with a large brush by cheap labor, this will act as a binder, holding back the oil, and making an excellent priming coat for the mill white. After the paint has dried hard against the shellaced surface, it is difficult for oil to soak through even over a long period of use.

In case it is necessary to clean a surface that has been previously whitewashed or painted with cold-water paint, the following method has been found inexpensive and successful. Select husky laborers having plenty of elbow grease and provide them with cheap wire brushes. Once over will take off all of the loose paint, and the particles that remain will be held by the binder of a suitable interior paint.

As any white surface is easily soiled by grimy hands, or by oil spattering from machines, it is advisable to run a 4 to 5-ft. colored dado from the floor to the window sills and on supporting posts, columns and pilasters. The color should be one that will not show grease or dirt. This costs no more than the regular paint and can be worked out into an attractive color scheme.

Finally, it is important in any plant using high-grade machinery, to use a paint that will not peel, for gritty particles may enter carefully adjusted bearings and ruin them.

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PLANTATION RUBBER CAUSES BIG REDUCTION IN PRICE

Four or five years ago Brazil produced most of the world's high-grade rubber supply, and the price per pound was steadily rising. It reached $3.00 a pound in 1910 and the supply was not nearly up to the demand, so that a serious crisis was in sight, and there was danger that the prices of rubber products, such as tires, would become prohibitive and seriously retard the developments of the automobile except as a toy of the very wealthy.

Meantime far-sighted men and companies had established vast plantations of young growing rubber trees, easily accessible, instead of being located in remote jungles,—and susceptible of the best scientific training. At first the product of these plantations was very small, but it has grown year after year until it is now greater than the wild rubber supply, and has not, even now, reached its full development. Crude rubber has recently been as low as 60 cents per pound. Recently there has been a little rise, but indications are that the trend will be gradually downward for some time, until a rock-bottom price, on the basis of a full development of the plantation system, has been reached.

Brazil, which in the beginning did not take seriously the menace of the plantations, failed to protect herself, either with extensive plantations of her own or by improving facilities for gathering her wild product and preparing it for market, so now the big basis of the crude supply is in other parts of the tropical world, such as Ceylon, the Philippines, etc.

As a result of these things, the Goodyear Tire & Rubber Co., which reduced its tire prices gradually, as crude rubber came down, is now supplying the trade a much better tire, at a much lower price, than a few years ago. This policy is vindicated by the fact that Goodyear sales in 1913 amounted to $33,000,000, at a profit of 6 1/2 per cent. on that volume. Thus it is apparent that Goodyear, while increasing the efficiency of its tire, has at the same time shared liberally with the trade, the advantage of lower crude rubber prices.

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Arabol Gum G, one of the staples of The Arabol Mfg. Co., 100 William St., N. Y. City, when used in its pure state gives excellent results in light and heavy sizing of cotton warps and is especially recommended for use on export goods, such as China shirtings, drills, denims, coarse or medium goods, etc. Mixed with starch it gives it more volume and adhesive power and adds elasticity and tensile strength.

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The Cabot Mfg. Co., Brunswick, Me., will add to its power plant equipment a 200 kv-a. alternating current generator and switchboard recently ordered from the General Electric Company.

THE GLIDDEN VARNISH CO.

At the last annual meeting of the Glidden Varnish Company, Francis H. Glidden, its founder, and who for thirty-one consecutive years had filled the office of president, surprised the board of directors by tendering his resignation. In so doing Mr. Glidden expressed his gratitude to those present for the many years he had been honored with their confidence in the management of the company's business. He made it clear that the prosperity of the Glidden Varnish Company was due more to the able assistance and cooperation of the competent young men and his four sons who had given so faithfully the many years of their best services in the upbuilding of the company.

Mr. Glidden, who is now past eighty years of age, but still active and enjoying good health, said it was time to give way to the younger element and declined to be reelected president. The board of directors in appreciation of the long service rendered by Mr. Glidden, created the new office of chairman of the board of directors, to which he was unanimously elected. The following officers were then elected, namely: Fred A. Glidden, president; F. K. Glidden, vice-president; W. J. Glidden, treasurer; R. S. Leonard, secretary.

The new president is not only popular with all his associates in the business, but also with the trade he has so vigorously helped to build up, and it is assumed that with his thorough knowledge of the details of the extensive business, that the company will continue its march of progress.

ADVANCE IN PRICE OF OVERCOATINGS

H. Bauendahl & Co. have sent out a circular to all their customers announcing the fact that, owing to the advance in wool and labor, their various overcoatings have been advanced five, seven and a half and ten cents a yard.

SWISS EMBROIDERY ESTABLISHMENTS

Vice Consul Eugene Nabel, St. Gall

Kellner's Statistics, a trustworthy yearly publication, gives the number of embroidery "establishments" in Switzerland and along the Austrian and German borders, at the beginning of the present year, as 1,859, operating 8,090 Schiffli embroidery machines, as compared with 1,704 establishments and 8,357 machines during the previous year. The 155 new establishments operate only one machine each. The decrease of 267 Schiffli machines is reported to be due to the fact that many old and short systems (5 and 6 3/4 yard lengths) have been discontinued.

These machines, of which 6,298 are pantograph and 1,792 "automats," are of the following systems: Hilscher, 39; Kappel, 65; Plauen, 3,028; Rieter, 5; Saurer, 4,953. Of the new 15-yard Schiffli machines there are at present 116 in operation, of which 46 are pantograph and 70 "automats." The number of hand-embroidery machines is estimated at 16,000.

BOSTON BRANCH

The W. Beckers Aniline & Chemical Works of Brooklyn, N. Y., have opened a Boston branch at 45 India St. and placed it in charge of Sydney Read David, Manager, where they will be glad to serve the trade interests.

FEED WATER DIFFICULTIES

"The problem of suitable feed water, although less serious in New England than in other parts of the country, is still a trouble maker in many plants. The formation of scale and the softening of water are due to the simplest of chemical reactions, and by an analysis of the water a competent chemist can readily predict in advance the proper amounts of suitable chemicals necessary to prevent scale or corrosion, and not only save the company the expense of frequent boring and replacing of tubes but obviate the necessity of attempting to force heat through the same substance with which many of your steam lines are insulated. The services of a chemist," said Carl F. Woods, secretary of the firm of Arthur D. Little, Inc., of Boston, when recently speaking before a group of street railway operators, "would prevent the purchase of a special compound at $1,000 a year, which consisted of 97 per cent. water and 3 per cent. molasses, or obviate the necessity of purchasing a mixture of soda ash, tannin and water under a brand name at 8 cents a pound when the principal ingredient can be obtained for 1 1cent a pound."

PROGRESS IN ARTIFICIAL SILK MANUFACTURE

Daily Consular and Trade Reports

The European press now states that the Fabrique de Soie Artificiele de Tubize, the leading Belgian company, which has hitherto manufactured by the gun-cotton process, is increasing its capital by $386,000 in order to acquire a controlling interest in a new company which will work the viscose system in Belgium. The report now issued shows a net profit of $209,000 against $265,000, and dividends of 25 per cent. on the preference shares and 20 per cent. on the ordinary shares are being paid. The report issued by the vereinigte Glanzstoff-Fabriken, Elberfeld, probably the largest producers of artificial silk in the world, shows a net profit of $1,367,000 against $887,000 in the previous year, and a dividend of 34 per cent. is proposed. Up to about two years ago this company worked only the cupro-ammonium process, but it has since adopted the viscose one, with good results. It has a large financial interest in the British Glanzstoff Mfg. Co., whose works are at Flint.

The Proximity Mfg. Co., Greensboro, N. C., will install an additional 200 h. p. induction motor and has purchased the machine from the General Electric Company.

PROFITS IN SEWING THREAD

The great Paisley firm of J. and P. Coats have rather disappointed the Stock Exchange in their report, though why this should be so is a little difficult to see. The Board of Trade returns are surely a trustworthy index of the state of the thread-making industry, and these show that the exports of sewing cotton have fallen off appreciably since 1910. They amounted in that year to 24,397,800 lbs. but in 1911 they fell to 23,032,200 lbs., and in 1912 to 22,571,700 lbs. The returns for the first six months of 1913—which complete the company's year—are also unfavorable, the total export being 10,719,300 lbs., as against 11,222,200 lbs. in 1912 and 11,162,300 lbs. in 1911. A net profit of £2,903,239 in these circumstances will, on reflection, we should think, seem distinctly good, for although it is below the £3,000,000 line, which was crossed in 1910-11 and 1909-10, it is £109,167 more than was made last year, and is more than enough to enable the directors to maintain the 35 per cent. distribution which they made for each of the last four years. The following table shows the position disclosed in the present dividend statement, compared with the two immediately preceding years:

	1912-13
New profit	$14,109,741.54
Brought forward	3,202,302.60
Available	17,312,044.14
Dividend and bonus	35%
To Reserve	2,430,000.00
Deb. redemption	.....
Carried forward	2,954,432.88

The net profit in 1909-10 was $15,413,315.04, in 1908-9 $14,183,856.76 and in 1907-8 $13,130,247.42. At one time the company had debentures amounting to $6,137,861.80, and although they only bore 3 3/4 per cent. interest they made an appreciable deduction from the sum available. It was decided, however, to pay them off, and $2,430,000 was taken for that purpose from the profits of 1909-10. The advantage of cheap money has been lost, but the concern is all the stronger for its freedom from debentures. Its general reserves will now amount to $26,730,000, and among other large sums specially ear-marked it has a dividend reserve of $10,206,000.

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The Patterson Mfg. Co., Kannapolis, N. C., has arranged to install twelve 25 h. p. four-frame motors with auto switches and a switchboard, and has placed the order for the apparatus with the General Electric Company.

The Phoenix Underwear Co., Little Falls, N. Y., will install additional electric drive equipment in its mill consisting of ten motors ranging from 1/2 h. p. to 75 h. p. and ten transformers from 15 kv-a. to 100 kv-a. capacity. The apparatus will be furnished by the General Electric Company.

The York Mfg. Co., Saco, Me., will install two additional 100 h. p. induction motors with auto oil switches and has ordered them from the General Electric Company.

COTTON MILLS SHOULD BURN ALL EGYPTIAN COTTON SEED

Daily Consular and Trade Reports

The Federal Horticultural Board at Washington has issued a notice to all cotton mills, and especially those in the South, to destroy by burning all seed that may be found in bales of imported Egyptian cotton. These seeds are likely to contain the larvae of the pink bollworm, which is very destructive to American cotton. The number of seeds of Egyptian cotton found in a bale of Egyptian lint is probably small and the presence of any seed in such bales is due to faulty ginning. Ginning and storing, however, does not kill the larvae of the pink bollworm, which has been known to withstand storage in cotton seed for more than seven months.

So dangerous to the cotton crop of the United States is the pink bollworm regarded that on May 28, 1913, a quarantine was promulgated, designed to prevent the introduction into the United States of this worm by forbidding the importation of cotton seed from all foreign countries excepting two regions in Mexico. Since that date several shipments of cotton seed infested by this worm have been intercepted and destroyed.

1911-12	1910-11
$13,579,189.92	$15,080,346.72
4,084,845.32	3,787,672.76
17,061,835.24	18,861,013.62
35%	35%
2,430,000 00	2,551,500.00
128,498.40	.....
3,202,302.60	4,084,845.32

The Horticultural Board has begun an investigation to determine the amount of infestation by the pink bollworm in the seed thus introduced. An agent will visit the northern and southern mills for this purpose. The elimination of the danger by improved methods of ginning or possibly by further quarantine regulations will have early consideration.

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The Link Belt Co., manufacturers of elevators and conveyors for efficient handling of all kinds of materials and complete power plant equipment, has recently sent out a notice of the removal of their Boston office to 49 Federal St., where they will be in a better position to take care of their rapidly increasing business.

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The Palmer Carpet Mills, Palmer, Mass., have arranged to discard their power plant and purchase power from the Central (Mass.) Power Company. The electrical equipment includes six Westinghouse motors from 2 to 25 h. p. each.

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The Swansea Dye Works, Fall River, Mass., will purchase all their power from the Fall River Electric Light Company, and are installing twenty Westinghouse motors with their switches and auxiliary equipment.

NEW PIPING EQUIPMENT

The Renfrew Mfg. Co., of Adams, Mass., is making some large installations in their steam and hot water piping equipment. They are changing over and remodeling their old system and installing new, low pressure, steam and hot water piping equipment for their dyehouse and bleachery according to plans and specifications prepared by the G. M. Parks Co., piping engineers and contractors of Fitchburg, Mass. In addition, they are also equipping their other buildings with steam heat and their bleachery and dyehouse with cold water supply piping. This work is carried on according to plans and specifications under the general supervision of Arthur F. Gray, mechanical engineer, 53 State St., Boston, Mass.

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COLOR CARD

In a special card descriptive of the series of Anthracene Yellows for shades fast to milling on wool, and issued by the Cassella Color Company, we notice the wide range of shades this group of dyes produce when employed as self-colors, from a yellow with a decided greenish cast to a yellow of a marked brownish tone.

Each of the eight dyes shown are accompanied by detailed descriptions of their individual properties, and which can well serve the practical wool dyer in making a proper selection for the work he has in mind. Full dyeing directions are given.

Copies of this card may be obtained from any of the offices of the Cassella Color Company by indicating the number 3,529.

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RUSSIAN COTTON-GROWING EXTENSION

A St. Petersburg report states that the Ministerial Diet has opened the discussion on the bill regarding the colonization of the Golodnaja Steppe, in the Samarkand Province, which starts the huge Central Asiatic scheme of the Ministry of Agriculture. It is proposed to push on energetically with irrigation work in various districts in Turkestan, the entire scheme providing for the irrigation of 3,000,000 dessiatines (8,100,000 acres) and involving an outlay of over 70,000,000 rubles ($360,500,000). The scheme is due largely to the activity of the present Minister of Agriculture, M. Kriwoschein, who personally made an extensive investigation of conditions in Russian Turkestan about two years ago. The chief object of the present bill is the development of cotton growing in Turkestan. The annual cotton production of Turkestan is now about 11,000,000 poods (800,000 bales of 500 pounds each), valued at round 100,000,000 rubles ($51,500,000), sufficient to supply about half the Russian requirements of raw material.—Consular Report.

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The Proximity Mfg. Co., Salisbury, N. C., will install five additional 25 h. p. motors and oil switches in its mills, the order having been placed with the General Electric Company.

RECORD COTTON CROP IN INDIA

Abstract from Indian (Government) Trade Journal

The final general memorandum on the cotton crop of 1913-14, issued by the Director General of Commercial Intelligence of India, summarizes the provincial reports of the cotton crop up to Feb. 1, 1914, and compares them with those for the two preceding seasons. The total area in all the territories reported is computed at 24,595,000 acres, a net increase of 2,567,000 acres, or 11.7 per cent. on the 22,028,000 acres (revised figures) at the same date last year. The total estimated outturn is 5,201,000 bales of 400 pounds each, as against 4,610,000 bales (revised figures) for last year, an increase of 591,000 bales, or nearly 13 per cent. These are the largest figures ever returned, and to the outturn should be added some 1,000 bales estimated as the production in Native States in Bihar and Orissa that make no returns.

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TREASURY DECISIONS

T. D. 34336. April 2, 1914. Drawback on woolen piece goods. Drawback on woolen piece goods imported in the gray and bleached, dyed and finished by the Botany Worsted Mills, of Passaic, N. J., and on such piece goods when printed for their account by the Manhattan Print Works, of Passaic, N. J.

T. D. 34348. April 6, 1914. Drawback on clothing. Drawback on men's clothing, suits, and overcoats, and women's garments manufactured by Fruhauf Bros. & Co., of New York, with the use of various imported materials.

T. D. 34365. Drawback on artificial silk cords and loops. T. D. 31383 of March 14, 1911, extended to cover cords and loops manufactured by Bernard Ulmann & Co. from dyed artificial silk yarn manufactured for and on their account from imported artificial silk yarn in the gray.

T. D. 34370. Drawback on clothing. Drawback on men's clothing manufactured by the Hirsch, Wickwire Co., of Chicago, Ill., with the use of imported woolens, Holland linings, and mohair linings.

T. D. 34373. April 11, 1914. Canvas hose. Not commercially known as hydraulic hose, dutiable at the rate of 30 per cent. ad valorem under paragraph 284 of the tariff act of 1913.

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Charles Bond Co., Philadelphia, Pa., recently secured an order for an unusually large belt to be used for conveying purposes. It was a "Veelos Balata" belt to be made 1,045 feet long, 30 feet wide and 6 ply.

The Waltham Bleachery and Dye Works are completing the electrification of their plant and are installing 400 h. p. in Westinghouse motors of special construction to resist acid fumes.

The Monument Mills, Housatonic, Mass., will add to their electric equipment two 100 h. p. induction motors and control panels ordered from the General Electric Company.

Recent Textile Patents

BOBBIN CLEANER. 1,090,999. William Lonzo, Fitchburg, Mass.

BOBBIN-CLEANING Device. 1,092,413. Joseph F. Vaillancourt, Fall River, Mass.

BRAIDING MACHINE. 1,091,805. Paul Butler, Lowell, Mass.

DRYING APPARATUS, Fabric. 1,090,934. Alfred T. Metcalf, Bradford, England.

FABRIC ARTICLES, Anchoring Member for. 1,093,213. Thomas Sloper, Wilts, England.

HOSIERY FORM. 1,091,247. John Rogginger, Kankakee, Ill.

INTERLINING FABRIC and Making Same, Woven. 1,091,197. George S. Cox, Philadelphia, Pa.

JACQUARD CARD, Blank. 1,093,142. Edward Maag, Mount Vernon, N. Y.

KNIT FABRICS, Machine for Uniting. 1,092,885. William C. Wright, Paducah, Ky.

KNITTING MACHINE Yarn Changing Device. 1,093,362. Harry Swinglehurst, Collingwood, N. J.

KNITTING FABRICS. 1,093,359. Robert W. Scott, Leeds Point, N. J.

KNITTING MACHINE, Circular. 1,092,577. Edward E. Kilbourn, New Brunswick, N. J.

KNITTING MACHINE, Circular. 1,092,166. Exilias Paquette, Lowell, Mass.

KNITTING MACHINE, Circular. 1,092,301. William E. Smith, New Brunswick, N. J.

LOOM SHUTTLE Feller Mechanism. 1,091,813. Harry A. Davis, Hopedale, Mass.

LOOM HARNESS. 1,090,858. Jacob Kaufmann, Philadelphia, Pa.

LOOM, Haircloth. 1,091,198. George S. Cox, Philadelphia, Pa.

LOOM SHUTTLE. 1,092,959. William P. Straw, Manchester, N. H.

LOOM SHUTTLE. 1,091,867. Edward S. Stimpson, Hopedale, Mass.

LOOMS for Weaving, Self-threading Shuttle for. 1,091,432. Denis M. Hollins, Blackburn, England.

LOOMS, Filling Severing Device for. 1,092,263. James W. Holliday, Liberty, S. C.

LOOMS, Filling-thread-cutting Mechanism for Weft Replenishing. 1,091,205. John R. Fitton, Worcester, Mass.

LOOMS, Actuating Means for Heddle-Frames of Weaving. 1,090,536. Fernand Houget, Verviers, Belgium.

LOOMS, Spool Changing Apparatus for. 1,088,824. Alber G. Koechlin, Basel, Switzerland.

LOOM, Weft Replenishing. 1,089,369. Horace Wyman, Worcester, Mass.

LOOM. 1,089,792. Alonzo E. Rhoades, Hopedale, Mass.

LOOMS, Protecting Device for the Tubes of Pile Fabric. 1,089,822. Alexander Clapperton, Yonkers, N. Y.

LOOM for Weaving Oriental Knot-pile Fabrics. 1,090,692. James K. Dalkranian, West Hoboken, N. J.

PILE FABRIC in Imitation of Natural Fur, Woven. 1,088,898. Fritz Hamer, Philadelphia, Pa.

RIBBON WINDING and Reversing Mechanism. 1,089,042. Walter J. Burchett, E. Orange, N. J.

SHUTTLE. 1,089,670. Francesco Renzo, Paterson, N. J.

SHUTTLE. 1,090,572. James C. Sergeson, Philadelphia, Pa.

SPINNING, Twisting and Analogous Machine. 1,090,757. Herbert Shackleton, Keighley, Eng.

THREAD GUIDE and Binder, Spool. 1,088,731. Alice Roller, New York.

TEXTILE CONDITIONING Instrument. 1,089,826. Charles J. Emerson, Providence, R. I.

MOISTENING METHOD and Apparatus, Yarn. 1,090,971. Osborn H. Cilley, Westfield, Mass.

NEEDLE THREADING Device. 1,090,916. Hermann Hertel, Gera, Germany.

SHUTTLE REPLENISHING Devices, Protecting Means for. 1,093,088. Sakichi Toyoda, Shimasakicho, Japan.

SHUTTLE DRIVING Mechanism. 1,093,239. Harrie A. Ballard, Boston, Mass.

SPINNING MACHINES, Building Motion for Ring. 1,091,015. Joseph Poisson, Fall River, Mass.

SPINNING FRAME. 1,092,631. Fernando Casablancas, Sabadell, Spain.

SPINNING MACHINE Doffing Mechanism. 1,090,958. Thomas O. Aked, St. Thomas, Canada.

THREAD, Fibrous. 1,093,183. Albert H. Henderson, Baltimore, Md.

THREAD, Machine for Manufacturing Artificial Silk and the Like. 1,093,146. Victor Planchon, Lyon, France.

THREAD WAXING Device. 1,091,126. Andrew Eppler, Lynn, Mass.

THREAD CUTTING Device. 1,091,412. Rudolf Wild, Los Angeles, Cal.

YARN CONDITIONING Machine. 1,092,976. Osborn H. Cilley, Westford, Mass.

RECENT TEXTILE TRADE-MARKS REGISTERED

70,148. Knitted and textile underwear. Mark: K.K. Owner: Cooper & Johnson, Kenosha, Wis.

75,163. Bleached cotton shirtings. Mark: Monarch. Owner: Converse & Co., New York.

75,823. Underwear. Mark: Kana Ford. Owner: Kahn & Frank, New York.

75,835. Pile fabrics, plushes and velvets. Mark: Golfette. Owner: A. Wimpfheimer & Bro., New York.

76,173. Yarn and threads of silk, cotton, jute, etc. Mark: Wafloweave. Owner: Dexter Yarn Co., Pawtucket, R. I.

61,338. Woolen piece goods. Mark: Oswego. Owner: American Woolen Co., Jersey City, N. J.

68,557. Outer coats. Mark: Standard Knit Coat, Regal. Owner: Harry Cohen, Philadelphia, Pa.

72,223. Woolen piece goods. Mark: Palm Beach. Owner: Goodall Worsted Co., Sanford, Me.

73,038. Cotton, linen and wool dress goods. Mark: Golden cross. Owner: Carson, Pirie, Scott, Chicago, Ill.

74,522. Cotton and woolen piece goods. Mark: Josef Ressel. Owner: Joseph Ressel, Friendland, Austria-Hungary.

74,825. Knitted Sweaters. Mark: Ajax. Owner: Novelty Knitting Mills, Philadelphia, Pa.

75,548. Sweaters and mufflers. Mark: Regal. Owner: Frank & Meyer Neckwear Co., St. Louis, Mo.

75,827. Textile fabrics. Mark: Chutedo. Owner: Societe Rodier, Paris, France.

76,058. Threads and yarns. Mark: Octagon. Owner: The Lees Mfg. Co., Westport, Conn.

76,167. Blankets. Mark: Saxon. Owner: Carson, Pirie, Scott & Co., Chicago, Ill.

76,216. Absorbent linen-mesh undergarments. Mark: Flaxal. Owner: The Linen Underwear Co., Greenwich, N. Y.

76,296. Textile rugs, mats, etc. Mark: Fervak. Owner: Stephen Sanford & Sons, Amsterdam, N. Y.

76,346. Unbleached muslin. Mark: Chamois. Owner: Carson, Pirie, Scott & Co., Chicago, Ill.

76,440. Silk piece goods. Marks: Kortex, Aztech, Montezoma, Navaho. Owner: M. C. Migel & Co., New York.

68,787. Household linen. Mark: Imperial. Owner: Remy, Schmidt & Pleissner, New York.

72,014. Hosiery. Mark: Good Fortune. Owner: A. Stieglitz & Co., New York.

76,400. Plushes in the piece. Mark: Uraloff. Owner: The Hind & Harrison Plush Co., New York.

76,616, 76,617, 76,618. Plushes in the piece. Marks: Pomoire, Lambtrex, Siberta. Owner: The Salt's Textile Mfg. Co., Bridgeport, Conn.

76,811. Silk piece goods. Mark: Tapageuse. Owner: Suplan Silk Co., New York.

76,813. Woolen, worsted, silk, cotton dress goods. Mark: "Ondula". Owner: George J. Geer, New York.

76,816. Handkerchiefs. Mark: Ajax. Owner: Hermann, Aukam & Co., New York.

71,353. Bleached cotton goods. Mark: Ivanhoe. Owner: Carson, Pirie, Scott & Co., Chicago, Ill.

75,591. Long-cloth and Cotton Cloth. Mark: Cloister. Owner: Sherman & Sons Co., New York.

75,707. Threads made from silk, cotton, linen and wool. Mark: Cameza. Owner: Cark Metz & Sons, Freiberg, Germany.

75,739. Cotton and linen piece goods. Mark: Japanese Idol. Owner: Trippe, Barker & Co., New York.

75,861. Knit goods. Mark: Knittofit. Owner: Adolph Bergman, Philadelphia, Pa.

56,190. Cotton piece goods. Mark: Stifel. Owner: J. L. Stifel & Sons, Wheeling, W. Va.

74,357. Blankets. Mark: Rabbit. Owner: Esmond Mills, Esmond, R. I.

75,269. Velvets and plushes in the piece. Mark: Meritex. Owner: The Salts Textile Mfg. Co., Bridgeport, Conn.

75,697. Yarns and threads. Mark: Gold band. Owner: Dexter Yarn Co., Pawtucket, R. I.

75,891. Cheviots. Mark: Raleigh. Owner: Pilot Cotton Mills, Raleigh, N. C.

74,043. Wilton pile fabrics. Mark: Durbar. Owner: Schofield, Mason & Co., Philadelphia, Pa.

Stephen D. Bennett, superintendent of the Necronsett Mills, Inc., Cumberland, N. C., has resigned to accept a similar position with the Wiscasset Mills Co., Albemarle, N. C. This mill has 70,000 ring spindles and manufactures women's seamless and children's hosiery.

W. J. Hampshire, overseer of dyeing at the S. Slater & Sons Mill, Webster, Mass., has resigned his position with that company.

G. Albert Brown, for the past four years second hand in the carding department at the Manchaug Co., Manchaug, Mass., has severed his connection with that company to accept a similar position with the Ann & Hope Mill, Lonsdale Co., Lonsdale, R. I. He was well thought of by those with whom he was associated and he has the best wishes of the foreman and the help for his future success.

Oscar A. Steere, superintendent and stockholder at the Hope Webbing Co., Pawtucket, R. I., died suddenly at Wickford, R. I., at the age of 63 years. Before accepting the position with the Hope Webbing Co., he was with the Hamilton Web Co., Hamilton, R. I., as overseer of weaving. Two sons and one daughter survive him.

C. H. Andrews has accepted the position of overseer of carding at the Athens Knitting Co., Athens, N. Y.

Thomas F. McDonald has accepted the position of designer at the M. T. Stevens & Sons Co., North Andover, Mass. He was formerly employed at the Bay State Mills, Lowell, Mass.

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65 Franklin Street, .. BOSTON, MASS.

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COTTON WOOLEN WORSTED MACHINERY

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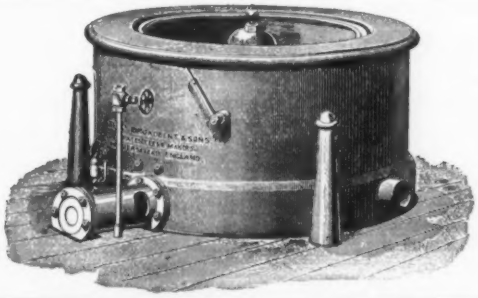

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Is the basis of confidence on which these machines are sold. It is confidence proved by their universal use. The saving in labor alone will pay for their cost in from six to twelve months, according to capacity.

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AMSTERDAM, NEW YORK, U.S.A.

Foreign Plant, HUDDERSFIELD, ENGLAND

Buyers' Index

This department is conducted for the benefit of our subscribers. The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisements. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in the classification here given such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources. Advertisers whose names do not appear under headings to which they are entitled will please notify the publishers.

Accountants and Systematizers.
Gunn, Richards & Co.

Air Moistening System.
——See Humidifying Apparatus.

Architects and Mill Engineers.
Cramer, Stuart W.
Dyer, W. E. S.
Ferguson, John W.
Main, Chas. T.
Myrick, J. W. H.

Asbestos Products.
Johns-Manville Co., H. W.

Asphalt Tanks.
Scaife, W. B., & Sons.

Auctioneers.
Conant, J. E., & Co.

Autophones.
Couch, S. H., Co., Inc.

Automatic Feeds for Cotton and Wool.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Saco-Lowell Shops.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Woonsocket Machine & Press Co.

Bale Presses.
Saco-Lowell Shops.

Baling Presses.
Boomer & Boschert Press Co.
Philadelphia Drying Mchy. Co.

Ballers.
Saco-Lowell Shops.

Ball Bearings.
Hess Bright Mfg. Co.
S. K. F. Ball Bearing Co.

Bandings.
Lambeth Rope Corporation.
Sternberg, Fred, & Co.

Bands, Labels and Tickets.
Acme Print Co.

Baskets.
Lane, W. T., & Bro.

Beams (Steel).
Mussle Frank, Co.

Beamers.
Crompton & Knowles Loom Works.

Belting.
Bond, Chas., Co.
Boston Belting Co.
Fairbanks Co., The.
Gandy Belting Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Hood, R. H., Co.
——See also Mill Supplies.

Belt Cement.
Graton & Knight Mfg. Co.

Belt Dressing.
Dixon, Jos., Crucible Co.
Graton & Knight Mfg. Co.
Stephenson Mfg. Co.

Belt Tighteners.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.

Bindings.
——See Tapes and Braids.

Bleaching Eyes.
Boston Belting Co.

Bleaching Kiers.
Arlington Mch. Wks.
Birch Bros. (Albert Birch, prop.).
Buhlmann, A. W.
Philadelphia Drying Machinery Co.
Stearns Lumber Co., A. T.
Textile-Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Electro Bleaching Gas Co.
Marston, John P.
Roessler & Hasslacher Chemical Co.
Seydel Mfg. Co., The.
Wolf, Jacques & Co.
Worden Chemical Works.

Blowers and Blower Systems.
Autoforce Ventilating System.
Carrier Air Conditioning Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Bobbins, Spools, Shuttles, Etc.
American Supply Co.
American Textile Specialty Mchy. Co.
Kunze, Otto.
Leigh & Butler.
Mossberg, Frank, Co.
Parker Spool & Bobbin Co.
Tebbets, E. L., & Co.

Bobbin Winders.
Altemus, J. K.
Lever, Oswald, Co.
Universal Winding Co.

Boilers.
——See Steam Boilers.

Boiler Graphite.
Dixon, Jos., Crucible Co.

Books.
Chittick, James.

Boxes, Box Shooks, Etc.
Pearson, J. T.

Box Tops.
Acme Print Co.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass Hinges.
Root, C. J., Co.

Bridges.
Scaife, W. B., & Sons.

Brushers.
——See Napping Machines.

Brushes.
Cocker, M., & Co.
Felton, S. A., & Son Co.
Mason Brush Works.
Parks & Woolson Machine Co.

Brushing Machines.
Buhlmann, A. W.
Parks & Woolson Machine Co.

Burlers, Speckers, Menders.
Providence Mending Co.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Button-Hole Machines.
Reece Button-Hole Machine Co.

Button Sewing Machines.
Union Button Sewing Machine Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Rice, Barton & Fales Mach. & Iron Co.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Taunton-New Bedford Copper Co.
Textile-Finishing Machinery Co.
——See also Dyeing, Drying, Bleaching, Machinery, etc.

Canvas Baskets.
Lane, W. T., & Bro.

Cap Spindles.
American Textile Specialty Mchy. Co.

Carbonizing Machinery.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Textile-Finishing Machinery Co.
Tolhurst Machine Works.

Card Clothing.
Ashworth Bros.
Buhlmann, A. W.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Buhlmann, A. W.
Dronsfield Bros.
Entwistle, T. C., Co.
Firth, William, Co.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Smith & Furbush Machine Co.

Carding Machinery.
Saco-Lowell Shops.

Card Stampers and Repeaters.
Hodgson, Walter W.

Carpet Machinery.
Altemus, Jacob K.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Parks & Woolson Machine Co.
Philadelphia Textile Machinery Co.
Smith & Furbush Machine Co.
Textile-Finishing Machinery Co.

Castings.
Dodge Mfg. Co.
Hunter, James, Machine Co.
Lunkenheimer Co., The.
Schofield, Wm., Co.

Caustic Soda.
Wing & Evans.

Cell Driers.
Cell Drier Machine Co.

Cement Pans.
Scaife, W. B., & Sons.

Chain Belts.
Morse Chain Co.

Chemists.
Little, Arthur D., Inc.
Lunkenheimer Co., The.

Chenille Machinery.
Eppler's, John, Machine Works.

Clearer Cloths.
American Felt Co.

Clocks.
Pettes & Randall Co.
Watchman's Clock & Supply Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Richardson Brothers.
Textile-Finishing Machinery Co.

Cloth Cutting Machines.
Eastman Machine Co.
Firth, William, Co.
Oswego Machine Works.

Cloth Dryers.
——See Drying Machinery.

Cloth Expanders.
Arlington Mch. Wks.
Birch Bros. Somerville Machine Wks. (Albert Birch, prop.).
Leyland, Thomas, & Co.
Somerville Mach. Wks. (Albert Birch, prop.).

Cloth Shrinking Machinery.
Reliance Machine Works.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Cloth Testers.
Firth, William, Co.
Perkins, B. F., & Son, Inc.
Scott, Henry L., & Co.
Shuttle Machine Co.
Suter, Alfred.

Cloth Winders.
Firsching, J. A.
Parks & Woolson Machine Co.

Clutches.
American Tool & Machine Co.
Dodge Mfg. Co.
Hunter, James, Machine Co.

Coal Analysis.
Little, A. D., Inc.

Coal and Ash Handling Machine.
Hunt, C. W., Co., Inc.

Cold Sawing Machine.
Burr & Son, John T.

Combs (Wool and Cotton).
Crompton & Knowles Loom Works.
Firth, William, Co.
Hood, R. H., Company.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Commercial Vehicles.
Kissel Motor Car Co.

Compressors (Air).
Allis-Chalmers Mfg. Co.

Condensers.
Allis-Chalmers Mfg. Co.
Dean Bros. Steam Pump Works.

Cones (Paper).
American Textile Specialty Mchy. Co.
Pairpoint Corporation.

Conditioning and Testing.
U. S. Conditioning & Testing Co.

Conveying Systems.
Dodge Mfg. Co.
Sturtevant, B. F., Co.

Coolers (Air).
Power Specialty Co.

Cop Machinery.
Epplers, John, Mach. Works.

Cop Tubes.
American Textile Specialty Mchy. Co.
Pairpoint Corporation.
——See Paper Tubes.

Copper Expansion Joints.
Badger, E. B., & Sons Co.

Copper Print Rollers.
Taunton-New Bedford Copper Co.

Coppersmiths.
Badger, E. B., & Sons Co.
Textile-Finishing Machinery Co.

Copper Work for Dyers.
Badger, E. B., & Sons Co.
Butterworth, H. W., & Sons Co.
Textile-Finishing Machinery Co.

Corduroy and Velvet Cutting Machines.
Firth, William, Co.

Corrugated Iron and Steel.
Scaife, W. B., & Sons.

Cotton.
Riley, C. E., Company.
Schwartz, L. H. A., & Co.

Cotton Dryers.
——See Drying Machinery.

Cotton Machinery.
American Textile Specialty Mchy. Co.
Ashworth Bros.
Barber-Colman Co.
Brown Spin-Wright Cotton Co.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cramer, Stuart W.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Dixon Lubricating Saddle Co.
Draper Company.
Easton-Burnham Co.
Elliot & Hall.
Entwistle, T. C., Co.
Fales & Jenks Mch. Co.
Firth, William.
H. & B. American Machine Co.
Klauder-Weldon Dyeing Machine Co.
Leigh & Butler.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Potter & Johnston Mch. Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Saco-Lowell Shops.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Stafford Co., The.
Textile-Finishing Machinery Co.
Textile Machinery Co.
Wildman Mfg. Co.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Potter & Johnston Mch. Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Saco-Lowell Shops.

Cotton Softeners.
Bosson & Lane.
Harding & Fancourt, Inc.
Marston, John P.
Seydel Mfg. Co., The.
Wolf, Jacques & Co.

Cotton Waste Machinery.
Firth, William, Co.
Saco-Lowell Shops.

Counting Machines.
Beck, Chas., Co.
Durant Co., W. N.
Root, C. J., & Co.

Couplings (Flexible-Insulated).
Bond Co., Charles.

Crayons.
American Crayon Co.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutting Machines.
Beck, Chas., Co.
Eastman Machine Co.
Firsching, J. A.
Oswego Machine Works.
Perkins, B. F., & Son, Inc.

Cylinder Oil (Superheated Steam).
Power Specialty Co.

Dash Pot Governors.
Marcellus & Tees.

Degreasing Wool.
Stabler, Owen.

Disinfectants.
Seydel Mfg. Co., The.

Dobbies.
Crompton & Knowles Loom Works.
Stafford Co., The.

Drawing Rolls.
Hood, R. H., Company.
H. & B. American Machine Co.
Metallic Drawing Roll Co., The.

Drinking Fountains.
Rundle-Spence Mfg. Co.

Drying Boards.
Pearson, J. T.
Philadelphia Drying Mchy. Co.

Drying Machinery.
American Tool & Machine Co.
Arlington Mch. Wks.
Bailey, Frank.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Sturtevant, B. F., Co.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.

Dusters.
——See Wool and Waste Dusters.

Dust Collectors.
Firth, Wm.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Dyers, Bleachers and Finishers.
Aberfoyle Mfg. Co.
Brophy's, T., Sons.
Davidson, John F.
Globe Dye Works Co.
Home Bleach & Dye Works.
Hopkinson Dyeing & Textile Works.
Lorimer's, The Wm. H., & Sons Co.
National Silk Dyeing Co.
Peerless Co.
Utica Willowvale Bleaching Co.

Dyeing, Drying, Bleaching and Finishing Machinery.
American Tool & Machine Co.
Arlington Mch. Wks.
Autoforce Ventilating System.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Butterworth, H. W., & Sons Co.
Cell Drier Machine Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Giles, J. H., Dyeing Machine Co.
Heathcote, John, & Son.
Hunt, Rodney, Mach. Co.
Hunter, James, Machine Co.
Hussong Dyeing Machine Co.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A., & Co.
Leigh & Butler.
Leyland, Thos., & Co.
National Laundry Machinery Co.
Parks & Woolson Machine Co.
Perkins, B. F., & Son, Inc.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Reliance Machine Works.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Sturtevant, B. F., Co. (Drying).
Sucker, G.
Suter, Alfred.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.
U. S. Hoffman Co.

Dye House Cans.
Hill, James, Mfg. Co.

Dye House Trucks.
Bailey, Frank.

Dye Kettles.
Stearns, A. T., Lumber Co.

Dye Sticks.
Bailey, Frank.
Klauder-Weldon Dyeing Machine Co.

Dye Tubs.
——See Tanks, Tubs and Vats.

Dyestuffs and Chemicals.
American Dyewood Co.
Atteaux, F. E., & Co.
Badische Co.
Bayer Co., The, Inc.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Electro Bleaching Gas Co.
Farbwerke-Hoechst Co.
Ford, J. B., Co.
Geisenheimer & Co.
Harding & Fancourt, Inc.
Holliday, Read & Sons.
Innis Speiden & Co.
Johnson, Chas. A., & Co.
Kalle Color & Chemical Co., Inc.
Klipstein, A., & Co.
Leyland, Thos., & Co.
Marston, John P.
Roessler & Hasslacher Chemical Co.
Seydel Mfg. Co.
Stein, Hirsh & Co.
Sykes, Walter F., & Co.
Thayer, Ed M., & Co.
Wing & Evans, Inc.
Wolf, Jacques & Co.
Worden Chemical Co.

Dynamos.
——See Electric Lighting.

Edgings.
——See Tapes, Braids and Edgings.

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The 20 K.W. unit has been in operation for the past two years and has given us perfect service without any exception.

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Sturtevant
(REG. U. S. PAT. OFF.)

Steam Turbines

are small users of steam, the forged steel solid rotor with milled-in buckets and the special nozzles and reversing chambers insure this. They are durable, the solid rotor can't wear out or fly to pieces. They are simple, there is nothing about them that can give trouble. Sturtevant Geared Turbine is adapted for driving any apparatus at any speed efficiently.

It will pay you to investigate this somewhat different turbine.

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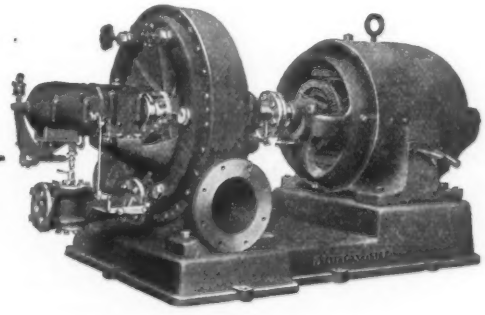

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Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electrical Heating Devices.
General Electric Co.

Electrical Supplies.
Johns-Manville Co., H. W.

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Dean Bros. Steam Pump Works.
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Electric Fans.
Allis-Chalmers Mfg. Co.
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Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Hoists.
Allis-Chalmers Mfg. Co.
General Electric Co.

Electric Lighting.
Allis-Chalmers Mfg. Co.
General Electric Co.
Johns-Manville Co., H. W.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis-Chalmers Mfg. Co.
Day, E. B.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electrolyzer.
National Laundry Machinery Co.

Elevators.
Craig Ridgway & Sons Co.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.
Salem Elevator Works.

Employes' Time Recorders.
Pettes & Randall Co.

Engines.
—See Steam and Oil Engines.

Exhaust Heads.
Power Specialty Co.
Sturtevant, B. F., Co.

Fans—Exhaust and Ventilating.
—See Ventilating Apparatus.

Feed Water Heaters.
Scaife, W. B., & Sons.

Feed Water Pumps.
Dean Bros. Steam Pump Works.
Goulds Mfg. Co.

Feed Water Purifiers.
American Water Softener Co.
Scaife, W. B., & Sons.

Feeds.
—See Automatic Feeds.

Felts (for every purpose).
American Felt Co.

Felt Hardeners.
Farrel Foundry and Machine Co.

Felt Rotary Washers.
Hunt, Rodney, Machine Co.

Felting Machinery.
Farrel Foundry and Machine Co.
Hunt, Rodney, Machine Co.

Fender Boards.
Case Brothers.

Filters.
American Water Softener Co.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Finishing Compounds.
—See Sizings.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Brick.
Borgner, Cyrus, Co.
Johns-Manville Co., H. W.

Fire Extinguishers.
Badger, E. B., & Sons Co.
Johns-Manville Co., H. W.

Fire Hose.
Boston Belting Co.
Eureka Fire Hose Co.
Goodyear Tire & Rubber Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Insurance.
Home Insurance Co.

Fire Proof Doors and Windows.
Badger, E. B., & Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combe-Barbour, Ltd.
Haskell-Dawes Machine Co.

Fluted Rolls.
Firth, William, Co.
Hood, R. H., Company.
H. & B. American Machine Co.
Leigh & Butler.
Metallic Drawing Roll Co.
Riley, C. E., Company.
Thurston, A. G., & Son.

Flyers.
Bodden, Wm., & Son, Ltd.
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Textile Machinery Co.

Folding Machines.
Shuttle Machine Co.

Forges.
Sturtevant, B. F., Co.

Friction Clutches.
—See Clutches.

Friction Cones.
Evans Friction Cone Co.

Fuel Economizers.
Sturtevant, B. F., Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Mach. Co.
Hunter, James, Mach. Co.
Kenyon, D. R., & Son.

Furnaces (Automatic Smokeless).
Murphy Iron Works.

Garnetts.
Hunter, James, Machine Co.
Leigh & Butler.
Smith & Furbush Machine Co.

Garnetted Stock.
Graves, Frank B.

Gas Blowers and Exhausters.
Sturtevant, B. F., Co.

Gas Engines.
Allis-Chalmers Mfg. Co.
Fairbanks Co., The.

Gas Systems.
Kemp Mfg. Co.

Gaskets (Superheated Steam).
Johns-Manville Co., H. W.
Power Specialty Co.

Gauges.
Lunkenheimer Co., The.

Gears.
New Process Gear Corporation.

Gear Cutting Machine.
Whiton, The D. E., Co.

General Call Service.
Couch, S. H., Co., Inc.

Generating Sets.
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant, B. F., Co.

Geyser Water Heater.
Sargent's Sons, C. G., Corp.

Gold Transfer Stamps.
Meyercord Company, Inc.

Greases.
Borne, Scrymser Co.
N. Y. & N. J. Lubricant Co.
Royersford Foundry & Machine Co.

Hangers.
—See Power Transmission Machinery.

Harness Twine.
Moore, C., & Co.

Harness and Frames.
Garland Mfg. Co.
Steel Heddle Mfg. Co.

Heating.
—See Ventilating Apparatus.

Heddles.
American Supply Co.
Firth, William, Co.
Lavigne & Suter.
Richards, Atkinson & Haserick.
Steel Heddle Mfg. Co.

Hoists.
—See Engines, Hoisting.

Hoisting Apparatus.
Economy Engineering Co.
Hunt, Rodney, Machine Co.
N. Y. Revolving Portable Elevator Co.

Hose.
Boston Belting Co.
Goodyear Tire & Rubber Co.

Hosiery Boards.
Pearson, J. T.
Philadelphia Drying Machinery Co.

Hosiery Labels.
Kaumagraph Co.
Meyercord Company, Inc.

Humidifying Apparatus.
American Moistening Co.
Carrier Air Conditioning Co. of America.
Cramer, Stuart W.
Parks, G. M., Co.

Humidity Controller.
American Moistening Co.
Carrier Air Conditioning Co. of America.
Cramer, Stuart W.

Humidity Gauge.
Johns-Manville Co., H. W.

Hydraulic Rams.
Power Specialty Co.

Hydro Extractors.
American Tool & Machine Co.
Broadbent, Thomas, & Sons.
Richards, Atkinson & Haserick.
Riley, C. E., Co.
Schaum & Uhlinger, Inc.
Schwartz, L. H. A., & Co.
Tolhurst Machine Works.

Insulating and Braiding Silks.
Sauquoit Silk Mfg. Co.

Insurance (Casualty, Fire and for Loss of Profits).
Home Insurance Co.
—See Liability Insurance.

Jacquards.
Crompton & Knowles Loom Works.
Halton's, Thomas, Sons.

Jacquard Cards.
Case Bros., Inc.

Keyseating Device.
Burr & Son, John T.

Keyway Broading Machine.
Burr & Son, John T.

Knit Goods Dryers.
—See Drying Machinery.

Knit Goods, Edgings, Trimmings, Etc.
Chapin, George W.
Cheney Bros.
Friedberger-Aaron Mfg. Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Hunt, Rodney, Machine Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Spindler, E. O.
Union Special Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Acme Knitting Machine & Needle Co.
Ainslie Knitting Machine Co.
Ames Knitting Machine Co., A. N.
Boss Knitting Machine Co.
Brinton, H., & Co.
Claes & Flentje.
Cooper, Charles.
Crane Mfg. Co.
Epplers, John, Mach. Works.
Gormly, Robt. W., & Co.
Grosser Knitting Machine Co.
Hemphill Mfg. Co.
Jenckes Knitting Mach. Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

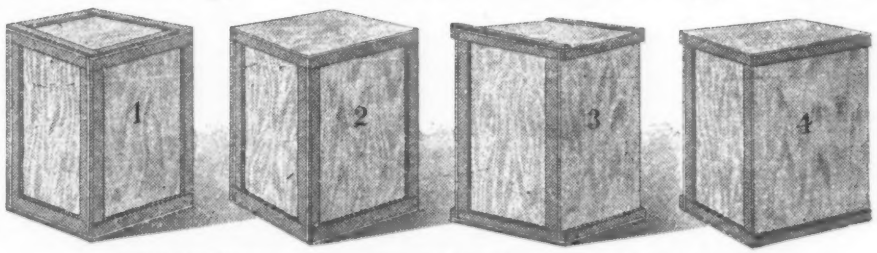
THE GARLAND LOOM HARNESSES

have the right "feel" and appearance.

An important feature of our loom harnesses is their appearance and their "feel." Their smooth finish and freedom from defects show that they will weave well and their soft pliable "feel" shows that they are tough and elastic and will therefore wear well.

GARLAND MFG. CO.
Saco, Maine

Three-Ply Veneer Packing Cases



LIGHTEST STRONGEST NEATEST

The weight is about forty per cent less than any other case of equal strength, enabling the shipper to save considerable in freight.

The veneer is made of three pieces of wood glued together with the center grain running in the opposite direction from the outside. This makes the strength more than double any other wood of equal thickness.

The sides, ends, tops and bottoms are made of one piece, thereby making a very neat and practically dust and dirt proof package.

If interested write us giving some of your sizes, weights to be carried and material to be packed.

Empire Manufacturing Company, Goldsboro, North Carolina

Lamb Knitting Machine Mfg. Co.
Leighton Machine Co.
Nye & Tredick Co.
Paxton & O'Neill.
Scott & Williams, Inc.
Spindler, E. O.
Stafford & Holt.
Standard Machine Co.
Stibbe, G., & Co.
Taylor, James.
Textile Machine Works.
Tompkins Bros. Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Machinery (Full Fashioned).
Hirsch, Louis.
Grosser Knitting Machine Co.
Spindler, E. O.
Textile Machine Works.
Walther, Otto.

Knitting Needles and Supplies.
Acme Knitting Machine & Needle Co.
Breedon's, Wm., Sons.
Brinton, H., & Co.
Continental Latch Needle Company.
Cooper, Charles.
Crane Mfg. Co.
Excelsior Needle Co.
Grosser Knitting Machine Co.
Ives, L. T., Co.
Keystone Latch Needle Co.
Lamb Knitting Machine Mfg. Co.
Spindler, E. O.
Wardwell Needle Co.

Labeling Machines.
Acme Staple Co.

Label Wire Stitchers.
Beck, Charles, Co.
Shoemaker, J. L., & Co.

Lace Leather.
Graton & Knight Mfg. Co.

Lace Machines.
Spindler, E. O.

Lamps, Electric.
General Electric Co.
Johns-Manville Co., H. W.
Westinghouse Electric & Mfg. Co.
Westinghouse Lamp Co.

Lanterns.
Dietz, R. E., Co.

Laying-up Machines.
Shuttle Machine Co.

Liquid Chlorine.
Electro Bleaching Gas Co.

Loom Pickers.
Garland Mfg. Co.
Graton & Knight Mfg. Co.

Looms.
Buhlmann, A. W.
Crompton & Knowles Loom Works.
Draper Company.
Leigh & Butler.
Mason Machine Works.
Richards, Atkinson & Haserick.
Saco-Lowell Shops.
Stafford Co., The.

Loopers.
Grosser Knitting Machine Co.
Hepworth, John W., & Co.
Leighton Machine Co.

Lubricants.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
N. Y. & N. J. Lubricant Co.
Royersford Foundry & Machine Co.
S. K. F. Ball Bearing Co.

Lubricators.
Lunkenheimer Co.

Lumpers.
Gerry, George, & Son.
Schofield, William, Co.

Machinery Dealers.
Saco-Lowell Shops.
Taylor, James.

Machinists' Tools.
Whiton, The D. E., Co.

Magnesia Products.
Johns-Manville Co., H. W.

Marking Pots.
Bradley, A. J.

Measuring and Folding Machines.
Curtis & Marble Machine Co.
Elliot & Hall.
Parks & Woolson Machine Co.

Mechanical Draft.
Sturtevant, B. F., Co.

Mechanical Draughtsmen.
Dodge Mfg. Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Tool & Machine Co.
Dodge Mfg. Co.
Myrick, J. W. H.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.

Mechanical Stokers.
Murphy Iron Works.

Mercerizers.
Globe Dye Works Co.
Home Bleach & Dye Works.
Lorimer, Wm. H., Sons Co.

Mercerizing Machinery.
Buhlmann, A. W.
Butterworth, H. W., & Sons.
Klauder-Weldon Dyeing Machine Co.
Schwartz, L. H. A., & Co.
Smith, Drum & Co.
Textile-Finishing Machinery Co.
Wolf, Jacques & Co.

Metallic Fire-Proof Window Frames and Sashes.
Badger, E. B., & Sons Co.

Metallic Packing.
Power Specialty Co.

Metallic Rolls.
Metallic Drawing Roll Co.

Mill Architects.
—See Architects and Mill Engineers.

Mill Builders and Engineers.
Dean, F. W., Inc.
Ferguson, John W.
Main, Charles T.

Mill Piping.
Parks Co., G. M.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Bond, Chas., Co.
Buckley's, Benjamin, Sons.
Dodge Mfg. Co.
Easton & Burnham Mch. Co.
Eureka Fire Hose Co.
Firth, William, Co.
Garland Mfg. Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Hess-Bright Mfg. Co.
Hood, R. H., Co.
Kunze, Otto.
Lane, W. T., & Bro.
Leigh & Butler.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Pairpoint Corporation.
Philadelphia Drying Machinery Co.
Powell, Wm., Co.
Richards, Atkinson & Haserick.
Richardson Bros.
Riley, C. E., Company.
Stephenson Mfg. Co.
Sweet & Doyle.
Thurston, A. G., & Son.

Mill Telephones.
Couch, S. H., Co., Inc.

Millwrights.
Hunter, James, Machine Co.

Moth Exterminator.
Berlin Aniline Works.

Motors.
—See Electric Motors.

Motor Trucks.
Kissel Motor Car Co.
Reo Motor Truck Co.

Napping Machinery.
Birch Bros., Somerville Machine Wks.
Buhlmann, A. W.
Curtis & Marble Machine Co.
Leigh & Butler.
Parks & Woolson Machine Co.
Schwartz, L. H. A., & Co.

Netting Machines.
Spindler, E. O.

New Woolen Clips.
Kaplan Wool Stock Co., Inc.

Noils (Silk).
Ryle, Wm., & Co.

Non-fluid Oils.
N. Y. & N. J. Lubricant Co.

Numbering Machines.
Beck, Charles, Co.

Oil Cups.
Lunkenheimer Co.

Oils.
Borne, Scrymser Co.
Harding & Fancourt, Inc.
N. Y. & N. J. Lubricant Co.

Oil Stencil and Press Board Paper.
Bradley, A. J.

Oiling Systems.
Lunkenheimer Co.

Oversewming Machines.
Merrow Machine Co.
Spindler, E. O.

Packing Cases.
Empire Mfg. Co.

Packings (Leather).
Graton & Knight Mfg. Co.

Packings (Metallic).
Power Specialty Co.

Packing (Rubber).
Goodyear Tire & Rubber Co.

Paints.
Briggs, John, & Company.
Chaffee, Thos. K., Co.
Glidden Varnish Co.
Johns-Manville Co., H. W.
U. S. Gutta Percha Paint Co.
Wadsworth, Howland & Co.

Pantagraphs for Mill Engraving.
Johnson, C. A., & Co.

Paper.
Beck, Charles, Co.
Merwin Paper Co.
Richardson Bros.

Paper Boards.
Merwin Paper Co.

Paper Cones and Tubes.
American Textile Specialty Machinery Co.
Pairpoint Corporation.

Patent and Trade Mark Solicitors.
Coleman, W. E.
Crosby & Gregory.
Heard, Smith & Tennant.
Howson & Howson.
Munn & Co.

Penstocks.
Hunt, Rodney, Machine Co.
Stearns Lumber Co., A. T.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pickers, Leather.
Garland Mfg. Co.

Pinking Machines.
Oswego Machine Works.

Pipes and Fittings.
Parks, G. M., Co.
Scaife, W. B., & Sons.

Plush Machinery.
Buhlmann, A. W.

Pneumatic Conveying.
—See Ventilating.

Portable Elevators.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.

Power Transmission Machinery.
Allis-Chalmers Mfg. Co.
American Mfg. Co.
American Pulley Co.
American Tool & Machine Co.
Brown, A. & F., Co.
Brown Spin-Wright Cotton Co.
Cresson-Morris Co.
Dodge Mfg. Co.
Evans, G. Frank.
Fairbanks Co., The.
Hess-Bright Mfg. Co.
Hunt, Rodney, Machine Co.
Hunter, James, Machine Co.
Leffel, James, & Co.
Morse Chain Co.
Perkins, B. F., & Son, Inc.
Reeves Pulley Co.
Royersford Foundry & Machine Co.
Saginaw Manufacturing Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Schofield, William, & Co.
Sellers, William, & Co.
S. K. F. Ball Bearing Co.
St. Louis Cordage Mills.
Textile Finishing Machinery Co.
Tolhurst Machine Works.

Preparatory Machinery (Cotton).
Firth, William, Co.
H. & B. American Machine Co.
Leigh & Butler.
Potter & Johnston Mch. Co.
Riley, C. E., Company.
Saco-Lowell Shops.

Presses.
Boomer & Boschert Press Co.
Butterworth, H. W., & Sons Co.
Curtis & Marble Machine Co.
Phila. Drying Machinery Co.
Reliance Machine Works.
Saco-Lowell Shops.
Spence & Rideout.
Textile-Finishing Machinery Co.
U. S. Hoffman Co.
Woonsocket Machine & Press Co.

Press Boards.
Beck, Charles, Co.
Case Bros., Inc.

Press Papers.
Beck, Charles, Co.
Merwin Paper Co.
Philadelphia Drying Mchy. Co.
Richardson Brothers (Importers and Dealers).

Pressure Regulators.
Davis, G. M., Regulator Co.

Printing Machinery.
Rice, Barton & Fales Mach. & Iron Co.

Production Engineers and Accountants.
Gunn, Richards & Co.

Pulley Covering.
Graton & Knight Mfg. Co.
Warren Co.

Pulleys.
——See Power Transmission Machinery.

Pumps.
Allis-Chalmers Mfg. Co.
Blake-Knowles Steam Pump Works.
Dean Bros. Steam Pump Works.
Deane Steam Pump Co.
Goulds Mfg. Co.
Hunt, Rodney, Machine Co.
Philadelphia Drying Machinery Co.
Textile-Finishing Machinery Co.
Worthington, Henry R.

Pump Governors.
Dean Bros. Steam Pump Works.

Purifying & Filtration Plants.
American Water Softener Co.
Dodge Mfg. Co.
Hungerford & Terry.
Norwood Engineering Co.
Scaife, W. B., & Sons.

Quillers.
Foster Machine Co.
Payne, G. W., & Co.
Universal Winding Co.

Rag Pickers.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Raw Hide Gears.
New Process Gear Corporation.

Reed and Harness Manufacturers.
American Supply Co.

Reed Making and Brushing Machines.
Lavigne & Suter.

Reed Wire.
Lavigne & Suter.

Revolving Portable Elevators.
N. Y. Revolving Portable Elevator Co.

Ribbons.
Cheney Bros.

Rodent Exterminator.
Danysz Virus, Ltd.

Roller Bearings.
Hess-Bright Mfg. Co.
Royersford Foundry & Machine Co.
S. K. F. Ball Bearing Co.

Roller Cloths.
American Felt Co.

Roller Logs.
Hartwell, G. E.

Roofing.
Barrett Mfg. Co.
Johns-Manville Co., H. W.

Rope and Twine Machinery.
Haskell-Dawes Machine Co.

Rope Dressing and Preservative.
Dodge Mfg. Co.

Rope Transmission.
American Mfg. Co.
Cresson-Morris Co.
Dodge Mfg. Co.
Hunt, C. W., Co., Inc.
Hunter, James, Machine Co.
Lambeth Rope Corporation.
St. Louis Cordage Mills.

Roving Cans.
American Vulcanized Fibre Co.
Firth, William, Co.
Hill, James, Mfg. Co.
Standard Fibre Co.

Roving Reels.
Scott, Henry L., & Co.

Rub Aprons.
Graton & Knight Mfg. Co.

Safety Set Screws.
Allen Manufacturing Co.

Safety Tubular Lanterns.
Dietz, R. E., Co.

Sample Cutters.
Oswego Machine Works.

Sanitary Fountains.
Rundle-Spence Mfg. Co.

Sash Operators.
Drouve Co., G.

Scales (Automatic).
American Kron Scale Co.
Fairbanks Co., The.
Toledo Scale Co.

Scales.
Torsion Balance Co.

Scallop Machines.
Merrow Machine Co.

Schappe (French Spun).
Suter, Alfred.

Schools.
International Correspondence Schools.
Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Scouring Machines.
——See Wool Washing, Preparing and Drying Machinery.

Second-hand Machinery.
——See Mchy. Dealers, also Classified Ads.

Selling Agent.
Shirley, Harold R.

Separators (Yarn).
Draper Co., The.
H. & B. American Machine Co.

Sewing Machine Benches.
American Tool & Machine Co.

Sewing Machines and Supplies.
Arlington Machine Works.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Somerville Mach. Wks. (Albert Birch, prop.).
Spindler, E. O.
Textile Finishing Machinery Co.
Union Special Machine Co.
Willcox & Gibbs.

Shafting Hangers, Etc.
——See Power Transmission Machinery.

Shafting Rings (Leather).
Graton & Knight Mfg. Co.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Scaife, W. B., & Sons.

Shell Rolls.
Thurston, A. G., & Son.

Shoddy Pickers.
Curtis & Marble Machine Co.
Smith & Furbush Machine Co.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc

Silk Dryers.
——See Drying Machinery.

Silk Machinery.
Arlington Machine Works.
Buhlmann, A. W.
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Leigh & Butler.
Lowell Machine Shop.
Mason Machine Works.
Richards, Atkinson & Haserick.
Schwartz, L. H. A., & Co.
Suter, Alfred.
Textile-Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

Silk Noils.
Fawcett, Hughes.

Silks (Raw).
Rolker, F.
Villa, A. P., & Bros.

Silk Specialist, Consulting.
Chittick, James.

Silk Throwsters.
Villa, A. P., & Bros.

Singe Plates.
Butterworth, H. W., Sons Co.
Taunton-New Bedford Copper Co.
Textile-Finishing Machinery Co.

Singeing Machines.
Birch Bros., Somerville Machine Wks
Butterworth, H. W., Sons Co.
Curtis & Marble Machine Co.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
American Diamalt Co.
Arabol Mfg. Co.
Corn Products Refining Co.
Malt-Diastase Co.
Marston, John P.
Seydel Mfg. Co., The.
Stein, Hirsch & Co.
Wolf, Jacques & Co.
Worden Chemical Works.

Skein Mercerizing Machines.
Buhlmann, A. W.

Skylights.
Drouve Co., G.
Van Noorden, E., & Co.

Slasher Cloths.
American Felt Co.

Slashers.
Leigh & Butler.
Riley, C. E., Company.
Saco-Lowell Shops.
Textile Finishing Machinery Co.

Soaps.
Dobbins Soap Mfg. Co.
Draper, J. O., Co.
Seydel Mfg. Co., The.
Wrisley, Allen B., Co.

Soaping Machines.
Hunt, Rodney, Machine Co.

Softeners.
——See Cotton Softeners.

Spindles.
Bamford & Smith.
Bodden, Wm., & Son, Ltd.
Buckley's, Benjamin, Sons.
Draper Company.
Easton & Burnham Mch. Co.
H. & B. American Machine Co.
Leigh & Butler.
Lowell Machine Shop.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Spindle Tubes.
Bamford & Smith.
Firth, William, Co.
Lowell Machine Shop.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Spinning Frame Saddles.
Dixon Lubricating Saddle Co.

Spinning Rings.
Draper Company.
H. & B. American Machine Co.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley's, Benjamin, Sons.
Lowell Machine Shop.

Spools.
——See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Allen, A. W.
Draper Company.
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Payne, George W., & Co.
Saco-Lowell Shops.
Spindler, E. O.

Spray Heads.
Jasper, E. W. S.

Stacks.
Scaife, W. B., & Sons.

Steam Boilers.
Scaife, W. B., & Sons.

Steam Engines.
Allis-Chalmers Mfg. Co.
Sturtevant, B. F., Co.
Textile-Finishing Machinery Co.

Steam Jacket Kettles.
Badger, E. B., & Sons Co.
Textile-Finishing Machinery Co.

Steam Pumps.
Buffalo Steam Pump Co.
Dean Bros. Steam Pump Works.
Goulds Manufacturing Co., The.

Steam Specialties.
Butterworth, H. W., Sons Co.
Davis, G. M., Regulator Co.
Lunkenheimer Co., The.
Powell, Wm., Co.
Sargent's Sons, C. G., Corp.
Sturtevant, B. F., Co.
Textile-Finishing Machinery Co.

Steam Traps.
Sturtevant, B. F., Co.

Steam Turbines.
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Stencil Machines.
Bradley, A. J.

Stock Dryers.
——See Drying Machinery.

Stocking Dryers.
——See Drying Machinery.

Stop Motion for Knitting Machines.
Boss Knitting Machine Works.

Stop Motion for Looms.
——See Warp Stop Motions.

Strappings.
Graton & Knight Mfg. Co.

Superheaters, Foster.
Power Specialty Co.

Tanks, Tubs and Vats.
Hall, Amos H., Son & Co.
Klauder-Weldon Dyeing Machine Co.
New England Tank & Tower Co.
Textile-Finishing Machinery Co.
Tolhurst Machine Works.
Scaife, W. B., & Sons.
Stearns, A. T., Lumber Co.
Woolford, G., Tank Mfg. Co.

Tapes, Braids and Edgings.
Barton, F. C.
Bias Narrow Fabric Co.
Chapin, George W.
Friedberger-Aaron Mfg. Co.
Industrial Tape Mills Co.
Krout & Fite Mfg. Co.
Lambeth Rope Corporation.
Maurer, F. W., & Sons Co.
Weimar Bros.

Teasels.
Suter, Alfred.

Telephones.
Pettes & Randall Co.

Temples.
Draper Co.

Testing Apparatus.
Perkins, B. F., & Son, Inc.
Torsion Balance Co.

Textile Chemists.
Little, A. D., Inc.

Textile Engineers.
Buhlmann, A. W.
Dodge Mfg. Co.
Myrick, J. W. H.
Suter, A.
——See also Architects and Mill Engineers.

Textile Organization and Cost.
Gunn, Richards & Co.

Textile Schools.
——See Schools.

Thread Guides.
Palmer, I. E., Co.

Time Detectors.
Watchman's Clock & Supply Co.

Tiering Machines.
Economy Engineering Co.
N. Y. Revolving Portable Elevator Co.

Tinsel Machinery.
Eppler's, John, Machine Works.

Tools for Turning Calender Rolls.
Dickinson, Thomas L.

Top Cutting Machines.
Wildman Mfg. Co.

Trade Mark Law.
Coleman, W. E.
Crosby & Gregory.
Heard, Smith & Tennant.

Trade Mark Stamps.
Kaumagrah Co.
Meyercord Company, Inc.
Parks & Woolson Machine Co.

Trucks.
Bailey, Frank.
Fairbanks Co., The.
Lane & Bro., W. T.

Trucks, Industrial.
Hunt, C. W., Co., Inc.

Tubes.
Pairpoint Corporation.

Turbines.
——See Water Wheels.

Twine.
American Mfg. Co.
Moore, C., & Co.
Richardson Bros.
St. Louis Cordage Mills.

Twist Counters.
Firth, William, Co.
Scott, Henry L., & Co.
Suter, Alfred.

Twisting Machinery.
Saco-Lowell Shops.
Smith & Furbush Machine Co.

Vacuum Extracting Machines.
Buhlmann, A. W.

Valves.
Lunkenheimer Co.
Fairbanks Co., The.
Marcellus & Tees.
Powell, Wm., Co.

Variable Speed Transmission.
Cell Drier Machine Co.
Hunter, James, Machine Co.
Reeves Pulley Co.

Velvet Machinery.
Buhlmann, A. W.
Schwartz, L. H. A.
Textile Finishing Machinery Co.

Ventilating Apparatus.
American Moistening Co.
Autoforce Ventilating System.
Berry, A. Hun.
Carrier Air Conditioning Co. of America.
General Electric Co.
Massachusetts Fan Co.
Parks, G. M., Co.
Perkins, B. F., & Son, Inc.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Tolhurst Machine Works.

Ventilating Engineer.
Myrick, J. W. H.

Warpers.
Crompton & Knowles Loom Works.
Draper Company.
Entwistle, T. C., Co.
Saco-Lowell Shops.

Warping.
Silk City Warping Co.
Smith, Alexander & Son.

Warping and Beaming Machinery.
Altemus, J. K.
Crompton & Knowles Loom Works.
Draper Company.
Entwistle, T. C., Co.
Lever, Oswald, Co.
Smith & Furbush Machine Co.
Sucker, G.
Suter, A.

Warp Stop Motions.
American Textile Appliances Co.
Crompton & Knowles Loom Works.
Draper Company.

Warp Tying Machines.
Barber-Colman Co.

Washers (Cloth).
Arlington Machine Works.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Butterworth, H. W., & Sons Co.
Hunt, Rodney, Machine Co.
Hunter, James, Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Somerville Mach. Wks. (Albert Birch, prop.).
Textile-Finishing Machinery Co.

Washers (Leather).
Graton & Knight Mfg. Co.

Washing Soda.
Ford, J. B. Co.

Waste Reclaiming Machinery.
Saco-Lowell Shops.

Waste Washing Machines.
American Tool & Machine Co.

Wastes.
Graves, Frank B.

Watchman's Clocks.
Pettes & Randall Co.
Watchman's Clock and Supply Co.

Water Chemists.
American Water Softener Co.
Hungerford & Terry.
Scaife, W. B., & Sons Co.

Waterproofing Materials.
Barrett Mfg. Co.
Johns-Manville Co., H. W.

Water Purifiers and Filters.
American Water Softener Co.
Hungerford & Terry.
Scaife, W. B., & Sons Co.

Water Softeners.
American Water Softener Co.
Dodge Mfg. Co.
Ford, J. B., Co.
Hungerford & Terry.
Norwood Engineering Co.
Permutit Co.
Scaife, W. B., & Sons Co.

Water Towers.
New England Tank & Tower Co.

Water Wheel Governors.
Hunt, Rodney, Machine Co.

Water Wheels.
Allis-Chalmers Mfg. Co.
Hunt, Rodney, Machine Co.
Leffel, James, & Co.

Weighing Apparatus.
American Kron Scale Co.
Fairbanks Co., The.

Winders (Cotton, Woolen and Worsted).
Allen, A. W.
Altemus, J. K.
Buhlmann, A. W.
Crompton & Knowles Loom Works.
Easton & Burnham Machine Co.
Firsching, J. A.
Foster Machine Co.
Leigh & Butler.
Lever, Oswald, Co.
Lindsay, Hyde & Co.
Parks & Woolson Machine Co.
Payne, Geo. W., & Co.
Saco-Lowell Shops.
Universal Winding Co.

Winders (Back).
Allen, A. W.
Taylor, James.

Alphabetical Index to Advertisers, with page numbers, follows this list.

Winders (Hosiery).
Allen, A. W.
Altemus, Jacob K.
Easton & Burnham Machine Co.
Foster Machine Co.
Grosser Knitting Machine Co.
Leighton Machine Co.
Lever, Oswald, Co., Inc.
Payne, G. W., & Co.
Saco-Lowell Shops.
Spindler, E. O.
Universal Winding Co.

Wood Pulleys.
Dodge Mfg. Co.
Saginaw Manufacturing Co.

Wool.
Richards, Atkinson & Haserick.

Wool Cleaning Compound.
Ford, J. B., Co.

Wool Combing Machinery.
Crompton & Knowles Loom Works.
Leigh & Butler.
Richards, Atkinson & Haserick.
Riley, C. E., Company.

Wool Dryers.
—See Drying Machinery.

Wool Oil Compound.
Marston, John P.

Wool and Waste Dusters.
Leigh & Butler.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Smith & Furbush Machine Co.

Woolen and Worsted Machinery.
Allen, A. W.
American Tool & Machine Co.
Altemus, Jacob K.
Arlington Machine Works.
Birch, Albert, Somerville Mach. Wks.
Birch Bros., Somerville Machine Wks.
Brecher, Felix.
Buhlmann, A. W.
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Curtis & Marble Machine Co.
Fales, L. F.
Firth, William.
Hood, R. H., Co.
Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Edw., & Bro.
Kenyon, D. R., & Son.
Klauder-Weldon Dyeing Machine Co.
Leigh & Butler.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Saco-Lowell Shops.
Sargent's, C. G., Sons.
Schofield, Wm., Co.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Somerville Machine Works (Albert Birch, prop.).
Textile-Finishing Machinery Co.
Woonsocket Machine & Press Co.

Wool Oils.
Borne, Scrymser Co.
Marston, John P.
Seydel Mfg. Co.

Wool Washing, Preparing and Drying Machinery.
Hunter, Jas., Machine Co.
Leigh & Butler.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Richards, Atkinson & Haserick.
Riley, C. E., Company.
Sargent's, C. G., Sons.
Schwartz, L. H. A., & Co.
Smith & Furbush Machine Co.
Speed & Stephenson.
Stabler, Owen.
Tolhurst Machine Works.

Yarn Conditioning Machines.
Emerson Apparatus Co.
Mertz, Victor E.
Sargent's, C. G., Sons.
Suter, Alfred.

Yarn Dryers.
—See Drying Machinery.

Yarn Testers.
Birch Bros., Somerville Machine Wks.
Firth, William, Co.
Scott, Henry L., & Co.
Shuttle Machine Co.
Suter, Alfred.
Torsion Balance Co., The.

YARNS, THREADS, ETC.

Carpet Yarns.
Lees, Jas., & Sons Co.

Cotton Yarns.
Chapin, Geo. W.
Jamieson, Jas. B.
Jenckes Spinning Co.
Littauer, Ludwig.
Marston, John P.
Mindlin & Rosenman.
Mitchell, Jas. E., & Co.
Montgomery, J. R., Co.
Monument Mills.
Orswell Mills.
Porter, T. J., & Sons.
Sternberg, Fred, & Co.
Street, J. F., & Co.
Trainor, The J. F., Company.
Whitman, William, Co.

Flax, Hemp, Jute and Ramie.
Fawcett, Hughes.
Littauer, Ludwig.
Mindlin & Rosenman.
Pfaltz & Bauer, Inc.
Porter, T. J., & Sons.
Ramie Agency.
Sternberg, Fred, & Co.

Gassed Yarns.
Jamieson, Jas. B.
Littauer, Ludwig.
Mindlin & Rosenman.
Sternberg, Fred, & Co.
Whitman, William, Co.

Glazed Yarns.
Chapin, Geo. W.
Jamieson, Jas. B.
Littauer, Ludwig.
Lorimer's, Wm. H., & Sons Co.
Mindlin & Rosenman.
Orswell Mills.
Sternberg, Fred, & Co.
Whitman, William, Co.

Harness Twine.
Fawcett, Hughes.
Moore, C., & Co.
Sternberg, Fred, & Co.

Hosiery and Knitting Yarns.
Chapin, Geo. W.
Hyde, E. S.
Jenckes Spinning Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Mitchell, Jas. E., & Co.
Monument Mills.
Porter, T. J., & Sons.
Sternberg, Fred, & Co.
Whitman, William, Co.

Linen Yarns.
Fawcett, Hughes.
Lindsay, Thompson & Co., Ltd.
Porter, T. J., & Sons.

Mercerized Yarns.
Aberfoyle Mfg. Co.
American Silk Spinning Co.
Jamieson, Jas. B.
Littauer, Ludwig.
Mindlin & Rosenman.
Porter, T. J., & Sons.
Sternberg, Fred, & Co.
Whitman, William, Co.

Mohair Yarns.
Littauer, Ludwig.
Mindlin & Rosenman.
Montgomery, J. R., Co.
Whitman, William, Co.

Novelty Yarns, Tinsels, Silk Noils, Etc.
American Silk Spinning Co.
Jamieson, Jas. B.
Jenckes Spinning Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Montgomery, J. R., Co.
Sternberg, Fred, & Co.
Villa, Stearns & Co.

Silk Yarns.
American Silk Spinning Co.
Champlain Silk Mills.
Chapin, Geo. W.
Cheney Bros.
Ryle, Wm., & Co.
Sauquoit Silk Mfg. Co.
Street, J. F., & Co.
Suter, Alfred.
Villa, Stearns & Co.

Silk Yarns (Artificial).
Littauer, Ludwig.
Mindlin & Rosenman.

Woolen and Merino Yarns.
Eaton Rapids Woolen Mills.
Hyde, E. S.
Jenckes Spinning Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Shirley, Harold R.
Street, J. F., & Co.

Woolen Yarns.
Jamieson, Jas. B.
Lees, Jas., & Sons Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Shirley, Harold R.

Worsted Yarns.
Lees, Jas., & Sons Co.
Littauer, Ludwig.
Mindlin & Rosenman.
Shirley, Harold R.
Whitman, William, Co.

Alphabetical Index to Advertisers, with page numbers, follows this list.

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Alphabetical Index to Advertisers

Aberfoyle Mfg. Co. 320b
Acme Ktg. Mch. & Needle Co... 371
Acme Print Co. 323
Acme Staple Co. 369
Ainslie Knitting Machine Co. .. 368
Allen, A. W. 370
Allen Mfg. Co. 305
Allis-Chalmers Mfg. Co. 331
Altemus, Jacob K. 44
American Crayon Co. 341
American Diamalt Co. 350
American Dyewood Co. 315
American Felt Co. .....Insert 272a
American Kron Scale Co. 37
American Mfg. Co. 32a
American Moistening Co. 38-304
American Pulley Co., The 56
American Silk Spinning Co. 335
American Supply Co. 308
Am. Textile Specialty Mchy. Co. 15
American Tool & Machine Co... 298
American Water Softener Co. .. 346
American Vulcanized Fibre Co. 306
Ames, A. N., Ktg. Machine Co. 365
Arabol Mfg. Co., The 273-322
Arlington Machine Works 306
Ashworth Bros. 308
Atteaux, F. E. & Co. 346
Autoforce Ventilating System .. 283

Badische Company 62
Badger, E. B., & Sons Co. 61
Bailey, Frank 352
Bamford & Smith 311
Barber-Colman Co. 292
Barrett Manufacturing Co. 342
Barton, F. C. 326
Bayer Co., The, Inc. 349
Beck Company, Chas. 371
Berlin Aniline Works 299-350
Berry, A. Hun 61
Bias Narrow Fabric Co. 326
Birch, Albert 296-309
Birch Bros. 296-309
Bischoff, C., & Co. 349
Blake & Knowles Steam Pump Wks. 374
Bodden, Wm., & Son, Ltd. 300
Bond, Charles, Co. 311
Boomer & Boschert Press Co. .. 308
Borgner, Cyrus, Co. 351
Borne, Scrymser Co. 28
Boss Knitting Machine Works. 372
Bosson & Lane 345
Boston Belting Co. 30
Bradley, A. J. 324
Breedon's Son, Wm. 373
Briggs, John, & Co., Inc. 370
Brinton, H., & Co. 362
Broadbent, Thomas, & Sons 257
Brophy's Sons, T. 340
Brown, A. & F., Co. 297
Brown Spin-Wright Cotton Co... 32
Buckley's, Benj., Son 326
Buhlmann, A. W. 49
Bukey Service 303
Burr, John T., & Son 327
Butterworth, H. W., & Sons Co. 1

Carrier Air Conditioning Co. of America 7
Case Brothers 370
Cassella Color Co. 345
Cell Drier Machine Co. 305
Chaffee Bros.' Company 308
Chaffee, Thos. K., Co. 32b
Champlain Silk Mills 334
Cheney Bros. 332
Chittick, James 336
Claes & Flentje 368
Cocker, M., & Co. 312
Coleman, Watson E. 274
Conant, J. E., & Co. 48
Continental Latch Needle Co. .. 372
Cooper, Charles 371
Corn Products Refining Co. 24
Couch, S. H., Co. 312
Cramer, Stuart W. 12
Crane Mfg. Co. 367
Cresson-Morris Co. 60
Crompton & Knowles Loom Works 16
Crosby & Gregory 283
Curtis & Marble Machine Co. .. 309

Danysz Virus, Ltd. 307
Davidson, John F. 340
Day, E. B. 267
Dean Bros. Steam Pump Works 374
Deane Steam Pump Co. ..... —
Dickinson, Thomas L. 3-6
Dietz Co., R. E. 16b
Dinsmore Mfg. Co. 302
Dixon, Jos., Crucible Co. 327
Dixon Lubricating Saddle Co. .. 308
Dobbins Soap Mfg. Co. ..... —
Dodge Mfg. Co. 328
Draper Company 2-3
Draper, J. O., Co. 323
Dronsfield Bros., Ltd. 341
Drouve, G., Co. 52
Durant Co., W. N. 305
Dyer, W. E. S. 283

Eastman Machine Co. Outside Back Cover
Easton & Burnham Mchy. Co. 18-19
Eaton Rapids Woolen Mills 330
Economy Engineering Co. 341
Electro Bleaching Gas Co. 349
Elliott & Hall 326
Emerson Apparatus Co. 294
Empire Mfg. Co. 263
Entwistle, T. C., Co. 18-19
Epplers, John, Mach. Works ... 373
Eureka Fire Hose Mfg. Co. 311
Evans Friction Cone Co. 311
Excelsior Needle Co. 373

Fairbairn - Lawson - Combe - Barbour, Ltd. 54
Fairbanks Co., The 45
Fales, L. F. 372
Fales & Jenks Machine Co. 18-19
Farbwerke-Hoechst Co. 347
Fawcett, Hughes 324
Felton, S. A., & Son Co. 308
Ferguson, John W. 283
Firsching, Joseph A. 369
Firth, William 42-296
Ford, J. B., Co. 314
Foster Machine Co. 4
Friedberger-Aaron Mfg. Co. 354

Gandy Belting Co. 313
Garland Mfg. Co. 263
Geisenheimer & Co. 351
General Electric Co. Inside Back Cover
Gerry, Geo. W., & Son ..... —
Giles Dyeing Mach. Co., John H. 46
Glidden Varnish Co. 320
Globe Dye Works Co. 340
Goodyear Tire & Rubber Co. 57
Gormly, Robert W., & Co. 360
Goulds Mfg. Co. 55
Graton & Knight Mfg. Co. Insert 272b
Graves, Frank B. 337
Grosser Knitting Machine Co. .. 356
Gunn, Richards & Co. 283

Hall, Amos H., Son & Co. 351
Hall, I. A., & Co. 336
Halton's, Thomas, Sons 300
H. & B. American Machine Co. 66
Harding & Fancourt, Inc. 284
Hartwell, Geo. E. 284
Haskell-Dawes Mach. Co. 58
Heard-Smith & Tennant 283
Heathcote, John, & Son 39
Hemphill Mfg. Co. 357
Hepworth, John W., & Co. 366
Hess-Bright Mfg. Co. 33
Hill, James, Mfg. Co. 337
Hirsch, Louis 363
Hodgson, Walter W. 323
Holliday, Read & Son, Ltd. 346
Home Bleach & Dye Works.. 47-340
Home Insurance Co. 339
Hood, R. H., Company 312
Hopkinson Dyeing & Textile Works 340
Howson & Howson 283
Hungerford & Terry 353
Hunt, C. W., Co., Inc. 302
Hunt, Rodney, Machine Co. 294
Hunter, Jas., Machine Co. 20
Hussong Dyeing Machine Co. .. 338
Hyde, Edward S. 324

India Alkali Works 338
Industrial Tape Mills Co. 324
Innis Speiden & Co. 349
International Cor. Schools 352
Ives, L. T., Co. 373

Jamieson, J. B. 330
Jefferson, Edw., & Bro. 330
Jenckes Knitting Mach. Co. 362
Jenckes Spinning Co. 324
Johns-Manville Co., H. W. 55
Johnson, Chas. A., & Co. 340

Kalle Color & Chemical Co., Inc. 350
Kaumagraph Co. 311
Kemp, C. M., Manufacturing Co. 293
Kenyon, D. R., & Son 292
Keystone Latch Needle Co. 373
Kissel Motor Car Co. 295
Klauder-Weldon Dyeing Mach. Co., The 258
Klipstein, A., & Co. 348
Krout & Fite Mfg. Co. 333
Kunze, Otto 326

Lamb Knitting Machine Co. 370
Lambeth Rope Corporation 312
Lane, W. T., & Bro. 27
Lees, James, & Sons Co. 330
Leffel, James, & Co. 374
Leigh & Butler 6
Leighton Machine Co. 53
Lever, Oswald Co., Inc. 13

Leyland, Thos., & Co. 17
Lindsay, Hyde & Co. 324
Littauer, Ludwig 336
Little, Arthur D., Inc. 274
Lorimer's, Wm. H., Sons Co. .. 340
Lowell Crayon Co. 324
Lowell Textile School 301
Lunkenheimer Co. 57

Main, Chas. T. 274
Malt-Diastase Co. 348
Marcellus & Tees 326
Marston, John P. 64
Mason Brush Works 307
Mason Machine Works 8
Massachusetts Fan Co. 298
Maurer, F. W., & Sons Co. 324
Merrow Machine Co. 363
Merwin Paper Co. 322
Metallic Drawing Roll Co. 36
Meyercord Company, Inc. 323
Mindlin & Rosenman 335
Mitchell Co., Jas. E. 322
Montgomery, J. R., Co. 322
Monument Mills 322
Moore, C., & Co. 322
Morse Chain Company 41
Mossberg, Frank, Co. 60
Munn & Co. 274
Murphy Iron Works 298
Myrick, J. W. H. 283

National Laundry Machy. Co. .. —
National Silk Dyeing Co. 332
New Bedford Textile School 312
New England Butt Co. 374
New Eng. Tank & Tower Co. .. 353
New Process Gear Corporation.. 29
N. Y. & N. J. Lubricant Co. 297
New York Revolving Portable Elevator Co. 60
Norwood Engineering Co. 353
Nye & Tredick Company 367

Orswell Mills 324
Oswego Machine Works 56

Pairpoint Corporation, The 268
Palmer, I. E., Co. 301
Parker Spool & Bobbin Co. 322
Parks & Woolson Machine Co... 58
Parks, G. M., Co. 10-11
Paxton & O'Neill 366
Payne, Geo. W., Co. 368
Pearson, Jos. T. 361
Peerless Company, The 340
Perkins, B. F., & Sons, Inc. 294
Permutit Co. 271
Pettes & Randall Co. 338
Pfaltz & Bauer, Inc. 323
Philadelphia Drying Mchy. Co... 16a
Philadelphia Textile Mchy. Co... 376
Philadelphia Textile School 303
Porter, T. J., & Sons 324
Potter & Johnston 18-19
Powell, Wm., Co. 331
Power Specialty Co. 306
Providence Mending Co. 327

Ramie Agency 324
Reece Button-Hole Machine Co. 364
Reeves Pulley Co. 61
Reliance Machine Works 296-346
Reo Motor Truck Co. 51
Rice, Barton & Fales Machine & Iron Co. 318
Richards, Atkinson & Haserick 326
Richardson Bros. 350
Ridgway, Craig & Sons Co. 316
Riley, C. E., Company 257
Roessler & Hasslacher Chemical Co. 347-348
Rolker, F. 336
Root, C. J., Co. 40
Royersford Foundry & Machine Co. 59
Rundle-Spence Mfg. Co. 302
Ryle, William, & Co. 334

Saco-Lowell Shops 5
Saginaw Mfg. Co. 327
Salem Elevator Works 304
Sargent's, C. G., Sons Co. 14
Sauquoit Silk Mfg. Co. 334
Scaife, W. B., & Sons Co. 351
Schaum & Uhlinger, Inc. 325
Schofield, William, Co. 341
Schwartz, L. H. A., & Co. ..... —
Scott, Henry L., Co. 290
Scott & Williams, Inc. 288
Sellers, Wm., & Co. 304
Seydel Mfg. Co. Outside Back Cover
Shirley, Harold R. 330
Shoemaker, J. L., & Co. 368
Shuttle Machine Co. 313
Silk City Warping Co. 334
S. K. F. Ball Bearing Co. 59
Smith, Alexander & Son 336
Smith, Drum & Co. 54
Smith & Furbush Mch. Co... 375-376
Somerville Machine Works .. 296-309
Speed & Stephenson 50
Spence & Rideout 370
Spindler, E. O. 355
Stabler, Owen 344
Stafford Co., The 22
Stafford & Holt 365
St. Louis Cordage Mills 32a
Standard Fibre Co. 344
Standard Machine Co. 369
Stearns, A. T., Lumber Co. 352
Steel Heddle Mfg. Co. 26
Stein, Hirsch & Co. 350
Stephenson Mfg. Co. 21
Sternberg, Fred, & Co. 322
Stibbe, G., & Co. 358
Street, J. F., & Co. 322
Sturtevant, B. F., Co. 261
Suter, Alfred 273
Sweet & Doyle 60
Sykes, Walter F., & Co. 350

Taunton-New Bedford Copper Co. 351
Taylor, James 364
Tebbets, E. L., Spool Co. 308
Textile-Finishing Machinery Co. Inside Front Cover
Textile Machine Works 371
Thayer, Edward M., & Co. 350
Thompson, Lindsay, & Co., Ltd. 324
Thurston, A. G., & Son 326
To'edo Scale Co. 43
Tolhurst Machine Works 300
Tompkins Bros. Co. 368
Torsion Balance Co. 309

Union Button Sewing Co. 370
Union Special Machine Co. 361
United States Conditioning & Testing Co. 336
U. S. Gutta Percha Paint Co. .. 9
U. S. Hoffman Co. 34-35
Universal Winding Co. Outside Back Cover
Utica Willowvale Bleaching Co. 338

Van Noorden, E., & Co. 306
Villa, A. P., & Bros. 335
Villa, Stearns Co. 333

Wadsworth, Howland & Co. 25
Walther, Otto 360
Wardwell Needle Co. 373
Warren Co., The 312
Watchman's Clock & Supply Co. 338
Weimar Bros. 319
Westinghouse El. & Mfg. Co. .. 31
Westinghouse Lamp Co. 23
Whitinsville Spinning Ring Co... 316
Whitman, William, Co. 330
Whiton, D. E., Machine Co. 306
Wildman Mfg. Co. 359
Willcox & Gibbs Sewing Machine Co. 373
Wing & Evans, Inc. 346
Wolf, Jacques & Co. 349
Woolford, G., Wood Tank Mfg. Co. 351
Woonsocket Mch. & Press Co. 18-19-320a
Worden Chemical Works 338
Worthington, Henry R. ..... —
Wrisley, Allen B., Co. 352

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Publisher's Page

Knit Goods Convention Issue

This number of the Textile World Record is the biggest issue we ever published, because of the very interesting articles and illustrations pertaining to the various meetings of Textile Associations and the Textile Exhibition held in Boston April 27 to May 2nd.

The June issue of the Textile World Record will be another very interesting and exceptionally large number, as it will contain an equally well reported account of the Annual Convention of the National Association of Hosiery and Underwear Manufacturers to be held in Philadelphia May 12, 13 and 14; and interesting illustrations and descriptions of Exhibits of the same organization's Exhibition in Philadelphia May 11 to 15.

Consequently the June issue will be an especially valuable one to those interested in the knitting industry.

Those who wish to make special announcements or to take increased space in the June number will kindly send their space reservations in promptly in order that careful attention may be given to their advertisements.

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Advertisers' Key Numbers

The attention of the Textile World Record subscribers is especially called to what is known as keying advertisements. You have doubtless noticed some advertisements in the Textile World Record with special numbers or with instructions to write for a specific booklet or piece of literature or to a department, or to have been requested by an advertiser to mention that you saw the advertisement in the Textile World Record.

Advertisers have good reasons for doing this, as they naturally want to know what publications are the most profitable for their advertising and wish to give credit to those responsible for inquiries and orders received.

The use of these different methods of keying an advertisement would be appreciated by our advertisers and by us also, as we naturally wish to get credit for any business produced as a result of advertising in the Textile World Record.

Our readers are, therefore, urged to use, as far as possible, the complete address and instructions when writing to advertisers, and also to mention the fact that the advertisement was seen in the Textile World Record. Doing the latter will help those advertisers whose advertisements are not keyed, as it will give them the information that all desire to have.

From the very gratifying letters that we get from different advertisers we know that many of our readers already do this, as so many of our advertisers speak of the excellent returns from their advertisements, but it would be a big help if all would do so. It would be a help not only to the advertiser and to the publisher, but to you and the readers, as the more productive advertising is, the more advertising there will be and the better chance you have of being kept informed (through good advertising copy) of new developments in the industry. These usually include new opportunities for increasing the quantity or adding to the quality of a mill's output—so keep in touch with the advertising pages.

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Monthly Circulation Statement

Of this edition over 6,400 copies are printed and all are needed.

The Textile World Record is a member of the Advertising Audit Association and Bureau of Certified Circulations and all circulation statements are guaranteed and made a part of each advertising order. Our books are always open to any Association or any present or prospective advertiser who wishes to verify our circulation figures. These books have been examined twice by the Association of American Advertisers.

American Felt Company

TRADE MARK

Oldest, largest and most progressive manufacturer in the country of Felts for all purposes.

Roller, Clearer and Slasher Cloths that are RIGHT produce the best yarns at the least expense.

We make cloths that suit your exact needs and are uniform in quality. Every yard is trade-marked for your protection.

Specify our products in ordering of your supply house. If they are out of stock, we will ship to you direct.

If your rollers are sent out of your mill to be covered, insist on the use of our trade-marked cloth. You are sure then.

American Felt Company

TRADE MARK

BOSTON, 103 Bedford Street
NEW YORK, 114 E. 13th Street.

Home Office and Factory
of
The Graton & Knight Mfg. Co.
Manufacturers of

LEATHER BELTING
Spartan (Steamproof)
Neptune (Waterproof)
Special Tanner (Waterproof)
Heart, GraKnight
GraKnight Dynamo

SPECIAL BELTS
Solid Round
Twist Round
Motorcycle
Cyclecar
"V" Shaped, etc.

BELT DRESSING

BELT CEMENT

LACE LEATHER

LEATHER SPECIALTIES
Washers
Packings
Shafting Rings
Hand Leathers
Pump Leathers
Automobile Leathers
Tire Sleeves
Halters
Horseshoe Pads

STRAPS
Blanket, Trunk
Skate, Mill, etc.

SHOE SUPPLIES
Insoles, Outsoles, Counters
Box Toes, Welting

The Graton & Knight Mfg. Co.
OAK LEATHER TANNERS AND BELT MAKERS
Worcester, Massachusetts, U.S.A.

BRANCHES

Atlanta, Boston, Cleveland, Chicago, Detroit, Fall River, Kansas City, Milwaukee, Minneapolis, Montreal, Can., New York, Philadelphia, Pittsburgh, Portland, Ore, St. Louis, San Francisco, Seattle

Selling Agents for Texas, The Graton & Knight Mfg. Co., Dallas, Texas.

ALFRED SUTER TEXTILE ENGINEER

200 Fifth Avenue - New York

Importer of all the latest types of

Testing Instruments
Conditioning Ovens
Yarn Numbering Scales
Yarn Reels
Universal Cloth and
Yarn Analyzing Set
Microscopes
Pick Counters

20" Twist Tester, with take-up registering device and magnifying glass for spinning twist

Combers Percentage Scale

The Arabol Manufacturing Co.

Offices: 100 William St., N. Y. Factories: Brooklyn, N. Y.

Manufacturers, Importers and Exporters
of all Materials used in

Sizing, Finishing, Softening, Filling and Weighting of Yarns, Fabrics and Raw Stock

Sizing, Tallows, Soluble Grease, Soluble Oils, Gums, Glues, Gum Arabol, Lancashire Size, Waxes, Finishing Pastes, Soaps, Glycerine, Readymade Heavy Size, Sago and Tapioca Flours, Dextrines, China Clay, Soluble Blue, Bone Grease, Magnesium.

Special Compounds for Warps where stop motions are used.

Weighting compounds for colored and white warps.

Finishing compounds for all classes of fabrics.

Silk Finishes for Satin Taffetas.

The Arabol best grades of cotton warp sizing compounds make the "finest weaving, and will hold the 'fly.'"

These compounds are based on the best practical experience and the best materials used in their manufacture.

TRADE MARK

ARTHUR D. LITTLE, Incorporated

CHEMISTS and ENGINEERS

Chemical Division

Design of Special Plants
Reducing Cost of Processes
Control of Supplies
Elimination of Wastes

Engineering Division

Fuel Economy and Smoke Abatement
Acceptance Tests on New Apparatus
Remodeling Power Plants
Steam Turbine Installation

93 Broad Street - - - Boston, Mass.

U. S. Worsted Co., Uswoco Mills, Lawrence, Mass.

CHARLES T. MAIN

201 Devonshire St., Boston, Mass.

Mill Engineer and Architect

Plans and Specifications for the erection, equipment, or reorganization of Textile Mills, and other Industrial Plants, including Steam and Water Power Plants.

Specialist and Expert

Examination of Water Powers, Water Power Plants and other Plants with reference to their improvement or value.

Examination of manufacturing properties with special reference to their value.

4-10

PATENTS **TRADEMARKS**

WATSON E. COLEMAN

Counselor-at-Law
Solicitor of Patents

Recommended Patent Lawyer in the Bankers' Register and special list of selected lawyers. Also in Martindale's Law Directory, Sharp & Alleman's Directory of Lawyers, The Gast-Paul Directory of Lawyers, and Kime's International Law Directory.

All Business Given Prompt and Proper Attention

PACIFIC BLDG., WASHINGTON, D. C.

Scientific Management

Four Authoritative Books worth hundreds of dollars to the man who will study and apply their teachings.

Principles of Industrial Engineering **$2.00**
By CHARLES B. GOING. The best treatise on fundamentals—with comparisons and results.

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Shop Management **$1.50**
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Cost Keeping and Scientific Management . . **$3.00**
By HOLDEN A. EVANS. For small plants.

Send orders or requests for descriptive folders to

LORD & NAGLE CO. 144 Congress St. BOSTON, MASS.

Patents **Trademarks**

MUNN & CO.,

363 Broadway,
New York.

Patent Specialists in the Textile Industry.

PATENTS

OLD SOUTH BUILDING
BOSTON, MASS.

HEARD, SMITH & TENNANT
NATHAN HEARD LOUIS C. SMITH F. A. TENNANT
Formerly
CROSBY & GREGORY
ESTABLISHED 1854

PATENTS AND PATENT CAUSES
TRADE MARKS, DESIGNS AND COPYRIGHTS

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CONSTRUCTING ENGINEER
Land Title Bldg., Philadelphia, Pa.
Designer of Factories, Mills and Power Plants
Textile Mills and Dye Houses our specialty.
Absolute Guarantee—Economy! Efficiency! Certainty!

John W. Ferguson Co.
Engineers and Building Contractors
Specialists in Mill,
Shop and Industrial Plant Construction
United Bank Building - Paterson, N. J.

HOWSON & HOWSON
Counselors at Law
Solicitors of Patents
PHILADELPHIA, West End Building.
32 South Broad Street
NEW YORK, Liberty Tower, 55 Liberty St.
WASHINGTON, 918 F Street

WOOL YEAR BOOK
In one volume are given outlines of woolen yarn manufacture, worsted yarn manufacture, on both English and French systems, weaving and finishing. There are numerous useful calculations, tables, recipes and notes. Brought up to date annually. 600 pages; green flexible leather. **Price, $1.00.**
Catalogue of Textile Books sent free
Lord & Nagle Co., Textile Publishers
144 Congress Street Boston, Mass.

J. W. H. Myrick, A. S. H. V. E.
Inventor of the
Autoforce Ventilating System
Largest Textile Ventilating Engineers in America
Boston, Mass.

FACTORY LIGHTING by CLEWELL

By Clarence E. Clewell, formerly Lighting Expert, Westinghouse Electric & Manufacturing Co., now of the Electrical Engineering Department, Sheffield Scientific School, Yale University. 160 pages, 6 x 9; 100 illustrations. Published August, 1913. $2.00 (8 x 4) net, postpaid.

Based on wide experience, it gives records to show: What Kind of Lights to Use in Different Rooms—How to Arrange Them—How Many to Install.

It emphasizes the importance of good lighting as a part of the equipment necessary in successful manufacturing.

There has been heretofore no similar book covering the practical questions of factory lighting.

It covers: I. General Items and Requirements. II. Illumination Design. III. Lighting Installation Work. IV. Lighting Maintenance Records. V. Office Lighting. VI. Drafting Room Lighting. VII. Factory Lighting VIII. Power House Lighting. IX. Iron and Steel Mill Lighting. X. Machine Tool Lighting.

LORD & NAGLE CO., 144 Congress Street, Boston, Mass.

Gunn, Richards & Co.

Production Engineers Public Accountants

Specialists in Textile Organization, Accounting and Costs

43 Wall Street 43 Exchange Place

New York

Money-Saving, Money-Making Opportunities

WANTS, FOR SALE, ETC.

This is a special department for those who wish to buy or sell second-hand machinery, mills or mill sites, patents, etc., and for such advertisements as "Help" or "Situations Wanted." A special low rate is charged, viz., $1.00 for one-half inch, single column; $2.00 for one inch, single column, and in the same proportion for larger space. By measuring these advertisements and counting the words you will see what space is needed for your announcement. No advertisement accepted for less than $1.00. Remittance should accompany the order. No extra charge for forwarding replies sent in care of the Textile World Record.

Address: Want-Ad Dept., Textile World Record, 144 Congress Street, Boston, Mass.

AGENTS WANTED

To sell skein silk, etc., used in the manufacture of shoe tassels and pompons. Samples furnished on request.

I am in the market for all grades of silk yarn, silk thread waste, silk clippings, silk cuttings, etc. Please submit detailed samples. Daniel J. Reilly, Jr., P. O. Station "S," 32 Ditmars St., Brooklyn, N. Y.

A Woolen Finisher

Now employed, experienced on all kinds of goods, seeks a change. Full particulars as to experience and reason for change on application to "Elmo," care Textile World Record, Boston, Mass.

MACHINERY FOR SALE

Two Crompton & Knowles Looms for narrow fabrics, thirty shuttles each, one inch spaces, practically new, sell cheap, need space for other work. Address "C. & K. Looms," Textile World Record, Boston, Mass.

Manufacturing in Canada

The new Official Register of Canadian Boards of Trade gives complete descriptions of all Commercial Towns with Industrial Opportunities. Indispensable to firms who wish to establish an industry in Canada. Write for free copy; mention Province.

DEPT. E., HEATON'S AGENCY, Toronto.

ROCK MAPLE LOGS

of The Best Quality

For Bleaching, Dyeing and Printing Rollers. Prompt delivery in any quantity. All consignments made direct from Adirondack Woods. Write for prices.

GEO. E. HARTWELL, Northville, N. Y.

HARDING & FANCOURT, Inc.

Kensington Soap Works

Soaps of Quality, Turkey Red Oil, Tuscan Softener, Soluble Oils and Olive Oil

516-18 So. Delaware Ave. PHILADELPHIA

FOREIGN MONEY CONVERSION ART CHARTS

Are part of a set for business firms, engineers, designers, &c. Special disc calculating charts made to order for textile and other calculations.

The S. C. Carpenter Drafting and Engineering Co.
49 Oakland Terrace, Hartford, Conn.

DYER WANTS POSITION

Dyer, German, thoroughly experienced on cotton hosiery or skeins, all fancy colors, sulphur and develop black, and oxidize black, familiar with mercerizing process. Also understands all bleaching on cotton and half silk perfectly. 39 years old, sober and reliable in every respect. Good references. Moderate salary. Address "Hosiery and Skein Dyer," Textile World Record, Boston, Mass.

A Russian Firm of Flax Exporters Desires

to make business connections for the marketing of raw and heckled flax and tow. Firms engaged in this trade and having first class references are requested to address J. C. 6244,
RUDOLPH MOSSE, Berlin, S.W., Germany

Wanted---Superintendent

thoroughly familiar with the manufacture and sale of wool shoddies, also capable of buying coarse wool. In replying please state experience and present location, giving references, and stating what salary is desired to start with. Address "Wool and Shoddy," Textile World Record, Boston, Mass.

Knitting Mill Wanted

A progressive Georgia town wants a knitting mill. It will give financial assistance to an experienced man with some capital of his own. Address Georgia Chamber of Commerce, Atlanta, Ga.

For Sale---Two Manufacturing Sites

One in City of Elmira, N. Y., within five minutes of four freight stations, nine acres, brick and iron buildings with 65,000 square feet ground floor space, switches from four railroads---L. V., P. R. R., Erie and D., L. & W. roads; one at Elmira Heights, N. Y., containing four acres with heavy frame buildings, 25,000 square feet ground floor space, with three switches from Erie, P. R. R. and D., L. & W. roads. **N. D. DOXEY, Elmira, N. Y.**

FOR SALE

18 Crompton & Knowles Looms, 25 Harness Cassimere Heads, 4 x 4 box 82 inch Reed Space. Iron back girth, 17 Tooth Vibrators, Friction Drive, will take 18-inch shuttle. First class condition. Can be seen any time.

Apply

C. WOLFENDEN - 250-256 West York Street Philadelphia, Pa.

NOTICE: PRACTICAL

BELT MAKER

WANTS A JOB

A-1 man on Belt repair work. Cement short pieces together; patch up old, torn belts. Make Belts endless.

I can do it right and cut your Belt Bills.

If not enough Belt work will do other work to fill in time.

Want a steady job.

Go anywhere.

Good references.

Address

WM. MILLER,
212 East 41st Street, Chicago, Ill.

FOR SALE

Complete Cotton Spinning Plant

IN FULL OPERATION

with latest, improved, up-to-date machinery, spinning from 10/1 to 26/1. Must be sold. Address

Schadewald Mills
3rd and Huntingdon Sts., Phila., Pa.

To Those Interested in the TEXTILE INDUSTRY

FOR RENT AT BARGAIN

Splendid plant consisting of number well-constructed, re-inforced concrete buildings, covering extensive grounds; buildings light and sanitary; excellent switching and railroad facilities.

Cheap power and illumination (electric and gas); labor conditions advantageous; suitable for silk mill or knitting mill or other textile industry.

Ample fire protection; property located within 21 miles New York City. Apply for particulars to ARTHUR C. LORD, Vice President, 25 Broad St., New York City.

Foster Coners For Sale

Ten Foster Coners with attachment for small tubes, as well as assortment of various sizes of cams. Address "Coners," Textile World Record, Boston, Mass.

Opening and Folding Machine

FOR SALE

Birch Bros. combined opening and folding machine. Folder can be adjusted to regulate side of fold. Machine is entirely new, never been use.z Will sell at a sacrifice.

WARD, MEEHAN CO., Phila., Pa.

FOR SALE

Orcutville Woolen Mill

STAFFORD SPRINGS, CONN.

Mill Buildings and Tenements, all recently repaired and in good condition. Located within fifty feet of railroad, with private station. Three sets of Cards, 15 Broad Looms, 5 Mules, 1,340 Spindles, with ample finishing machinery, for Broadcloths, Kerseys, Uniforms or goods of like character. Modern fire protection. Electric light equipment. Good water power, two large reservoirs of pure water. Auxiliary Steam Power. Mill only recently stopped, can be started at short notice. Price low, terms liberal. *No lease.* Great opportunity for live man with moderate capital. Inquire at Mill, or of A. D. ELLIS, Monson, Mass.

For Sale

One of the best equipped wool scouring plants in the West

Equipped with the following machinery: One 48 inch Sargent's (Latest Model) parallel rake machine, one 26 foot, one 20 foot, and two 16 foot bowls, length of machine with feed, 95 feet. Equipped with lapped rolls also four extra top rolls keyed for Boston Belting Co., rubber rings, one extra carrier.

One Wm. White 36 inch parallel rake machine, one 32 foot, and three 16 foot bowls, length 90 feet.

One four section 60 foot wool dryer, 6 foot apron, capacity 1,000 lbs scoured wool per hour, four coils, six fans. Delivers wool off dryer cold.

One double cylinder 48 inch Parkhurst burr picker and self feed with extra burr cylinder.

One Sargent duster steel cover, one Wm. White duster wood cover.

One Kennicott water softener, 10 feet in diameter, 30 feet high.

Two belt power bagging machines, two steam pumps.

One 110 horse slide valve engine, one 10 horse slide valve engine, one Kawnee Boiler Co., 125 horse horizontal tubular boiler, length 16 feet 70 tubes, diameter tubes 4 inches, set for 105 lbs pressure. Perfect condition.

Building owned by company, but on R. R. Co. leased ground. Can be bought and operated as it now stands, or will sell machinery separate. Other items too numerous to mention can be had on application. All machines in A1 condition.

THE FORBES WOOL CO., Trinidad, Col.

Situations Wanted

Manufacturers who are in need of Superintendents or Overseers for any department of mill work may learn of suitable men upon application by mail or telephone to C. T. DONLEVY, care Textile World Record, 144 Congress Street, Boston., who will give prompt attention to their requirements without charge.

Superintendent Wants Position

Superintendent of worsted yarn mill (Bradford System) with many years' experience in successful plant, wants position. Will go anywhere and "deliver the goods." For interview and details address "Careful," Textile World Record, Boston, Mass.

POSITION WANTED BY
Office Manager and Head Book-keeper

At present employed but desires to make a change. Thorough accountant including theory in cost accounting. Experienced credit man. Excellent record; 36 years old with 15 years service in the knit-goods business. Can deliver the goods. Address "Office Manager," Textile World Record, Boston, Mass.

Superintendent, assistant superintendent or overseer of spinning, spooling and warping in cotton mill; has worked on both fine and coarse numbers; familiar with both English and American makes; 43 years of age, married; will not go South or to Canada; good reference.
6176, Textile World Record, Boston, Mass.

Overseer of Ring Spinning in cotton mill; would consider second hand position; has worked on combed, carded, Peeler, Sea Island, cotton waste, Egyptian and all short stock; familiar with Fales & Jenks, Saco & Pettee, Whitin, Mason, Howard & Bullough and Lowell frames; 24 years of age; good reference.
6177, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning; has worked on all classes of woolen goods; familiar with Johnson & Bassett and Davis & Furber mules and operators; 28 years of age, married; good reference.
6178, Textile World Record, Boston, Mass.

Superintendent or assistant manager in cotton mill; has spun cotton yarns from 8s to 60s on ring frames; has woven all sorts of plain cotton cloth; familiar with cotton spinning and weaving machinery; 33 years of age; good reference.
6179, Textile World Record, Boston, Mass.

Overseer of Knitting or looping in hosiery mill; has worked on boy's, children's, men's and women's hose, both soft and mixed yarn; familiar with Acme, Mayo, Jenks, Standard, Boss, Keystone, and all classes of ribbers and loopers; 34 years of age, married; will go West and South; good reference.
6180, Textile World Record, Boston, Mass.

Overseer of Spinning in woolen mill; has worked on dress goods, men's wear, etc., using all wool, cotton and shoddy mixes, both high and low grade stock; spinning yarn from 7/8 run to 8 run; familiar with Davis & Furber and Johnson & Bassett machines; 32 years of age, married; will not go to Vt., Pa., N. Y., N. J., West, South or to Canada; good reference.
6181, Textile World Record, Boston, Mass.

Overseer of Carding or spinning in woolen mill; has worked on all wool, cotton and wool mixes; cotton, wool and shoddy mixes, and all cotton; familiar with Smith, Davis & Furber cards and Davis & Furber mules; 48 years of age, married; will not go to Vt., Pa., N. Y., N. J., West, South or to Canada; good reference.
6182, Textile World Record, Boston, Mass.

Assistant Superintendent of hosiery mill; would accept position as superintendent of small mill or overseer of any room in hosiery mill; has worked on all classes of hosiery; familiar with Banner, Invincible, Acme, Geo. D. Mayo, Scott & Williams footers, also Wildman, Scott & Williams and Brinton ribbers; will not go to Me., or Canada; good reference.
6183, Textile World Record, Boston, Mass.

Overseer of Finishing in woolen mill; has worked on woolens and worsteds; will not go West, South or to Canada; 48 years of age, married; good reference.
6184, Textile World Record, Boston, Mass.

Overseer of Carding in cotton mill; has worked on all classes of cotton on both fine and coarse numbers; familiar with Howard & Bullough, Dobson & Barlow, Woonsocket, Whitin, Potter & Johnson and Providence machines; 38 years of age, married; will not go to Me., Pa., N. Y., N. J., West, South or to Canada; good reference.
6185, Textile World Record, Boston, Mass.

Master Mechanic or factory inspector; 42 years of age, married; will not go West, South or to Canada; good reference.
6186, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on high and low grade goods, raw stock, piece dyeing, all wool and union carbonizing; 34 years of age, married; will not go to Me., Pa., N. Y., N. J., West, South or to Canada; good reference.
6187, Textile World Record, Boston, Mass.

Overseer of Weaving in woolen mill; has worked on woolens and worsteds; familiar with Crompton & Knowles looms; 30 years of age; good reference.
6188, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on worsted yarns, dress goods, braid slubbing, serge linings, unions, etc.; understands sulphur and bi-sulphite bleaching; familiar with dyeing machinery; 33 years of age, married; will not go South; good reference.
6189, Textile World Record, Boston, Mass.

Superintendent of knitting mill; would consider position as boss carder in knitting mill or boss knitter; has worked on all kinds of knit goods, underwear, hosiery and sweaters; familiar with most all kinds of upright and latch needle machines; 50 years of age; good reference.
6190, Textile World Record, Boston, Mass.

Cooper Fixer or foreman on cooper machines; has had experience on spring needle and latch needle machines, Scott & Williams and Wildman, also Payne winders; has worked on all grades of goods; cotton, merino, silk, lisle and mercerized; 25 years of age; will not go to Canada; good reference.
6191, Textile World Record, Boston, Mass.

Agent or superintendent in woolen mill; has worked on all kinds of men's and women's wear including chinchillas; familiar with jacquards and all kinds of woolen and worsted machinery; 50 years of age, married; good reference.
6192, Textile World Record, Boston, Mass.

Overseer of Cotton Carding, boss comber or second hand; has worked on all classes of goods from very low grade Russian cotton to fine Egyptian and Sea Island cotton; familiar with Dobson & Barlow, Howard & Bullough, Platt Bros., Whitin, etc., machines; 25 years of age; good reference.
6193, Textile World Record, Boston, Mass.

Overseer of Woolen Spinning; would consider good second hand position; has worked on all wool, low stock, cotton and silk noil and cotton and wool; familiar with Davis & Furber, Johnson & Basett and Paul mules; 38 years of age, married; will not go to Me., Vt., Pa., N. Y., N. J., West, South or to Canada; good reference.
6194, Textile World Record, Boston, Mass.

Overseer of Weaving in cotton mill; has worked on prints, fine lawns, plain umbrellas with tape selvage; familiar with Kilburn & Lincoln, Mason, Crompton & Knowles plain looms; will not go to Pa., N. Y., N. J., West, South or to Canada; 43 years of age, married; good reference.
6195, Textile World Record, Boston, Mass.

Agent or superintendent and agent in woolen mill; would consider position as styler for commission house; has worked on all grades of woolen and worsted goods; familiar with all makes of machinery; good reference.
6196, Textile World Record, Boston, Mass.

Overseer of Finishing or finishing and dyeing in woolen mill; has worked on woolens, worsteds, piece dyes, dress goods, of all kinds; cottons and cotton worsteds, in fact most everything; familiar with most all makes of machinery; 28 years of age, married; will not go West or to Canada; good reference.
6197, Textile World Record, Boston, Mass.

Second Hand of Carding and combing rooms in cotton mill; has worked on most all kinds of goods from long and short cotton, making fine and coarse yarns, filling and warping; familiar with Kitson pickers, Whitin, Saco & Pettee, Hetherington, Howard & Bullough cards, doublers, combers and speeders; 29 years of age; good reference.
6198, Textile World Record, Boston, Mass.

Overseer of Dyeing in woolen mill; has worked on piece dyeing and raw stock; will not go to Pa., West, South or to Canada; good reference; 50 years of age, married.
6199, Textile World Record, Boston, Mass.

Overseer of Dyeing or superintendent in woolen mill; has worked on all classes of woolens, worsteds, knit goods, hosiery, stock and yarn on the dyeing end and on fancy and plain piece dyes on manufacturing; familiar with all modern textile machinery from the yarn up; partially on yarn carding and spinning; 39 years of age, married; good reference.
6200, Textile World Record, Boston, Mass.

Superintendent or assistant superintendent in cotton mill; would consider position as overseer of carding in large mill; worked on hosiery yarns, print goods and ginghams; familiar with all makes of carding machinery, looms and spinning frames; will not go to Pa., West, South or to Canada; 32 years of age, married; good reference.
3951, Textile World Record, Boston, Mass.

Overseer of Dressing in woolen mill; would take charge of spooling, winding and twisting; has worked on worsteds, woolens, cottons and all classes of goods; familiar with Davis & Furber, Cleveland and all makes of dressing and spooling machines; Collins Bros. twisters and skein winders; 26 years of age, married; good reference.
6174, Textile World Record, Boston, Mass.

Overseer of Warping, spooling, slashing, drawing-in or on tying machines in cotton mill; has worked on all kinds of goods including fancy and auto goods; familiar with slashers, spoolers and warpers; 41 years of age, married; good reference.
6175, Textile World Record, Boston, Mass.

Overseer of Weaving in cotton mill; has worked on shirtings, dress goods, lenos, repps, twills, Bedford cords and plain goods; has a knowledge of designing, yarn and cloth calculations; familiar with Crompton & Knowles box looms, Lowell and Draper looms; 36 years of age, married; prefers New England; good reference.
6155, Textile World Record, Boston, Mass.

Designer in Woolen Mill; has worked on woolens, worsteds, men's wear and dress goods; 26 years of age; prefers East.
6157, Textile World Record, Boston, Mass.

Fixer in Knitting Mill; has worked on sweaters; familiar with the Leighton, Stafford & Holt, Dubied, Grosser and some experience on sewing machines; 22 years of age; will not go to N. Y., West, South or the Western part of Canada; good reference.
6111, Textile World Record, Boston, Mass.

Assistant Designer in woolen mill; has worked on all kinds of men's wear, both plain and fancy in worsted, woolen, cotton and also ladies' worsted goods; familiar with different kinds of looms; 30 years of age, married; good reference.
6158, Textile World Record, Boston, Mass.

Superintendent of underwear mill, overseer, or sales manager; has worked on ribbed cloth, flat goods, balbriggans, etc.; familiar with most all kinds of machines in the manufacture of these goods; 24 years of age; will not go to R. I., Conn., Me., N. H., Vt., South or to Canada; good reference.
6159, Textile World Record, Boston, Mass.

Second Hand in woolen card room; has worked on dress goods, overcoatings and nub yarn; familiar with Davis & Furber and Barker machines; will not go to N. J., West, South or to Canada; 22 years of age; good reference.
6160, Textile World Record, Boston, Mass.

Overseer of Spinning in woolen mill; has worked on plaid backs, bearskins, flannels, uniform goods, chinchillas, zibilenes, etc.; yarn from one-half to ten run; familiar with Davis & Furber and Johnson & Bassett machines; 43 years of age, married; will not go to Pa., West, South or Canada; good reference.
6161, Textile World Record, Boston, Mass.

Overseer of Knitting; has worked on ribbed work, cotton, wool and worsted; familiar with all kinds of yarn, stitches and also understands the cutting of goods; familiar with Wildman, Scott & Williams, Leighton and Cooper machines; has had some experience on about all other makes and styles of machines; 28 years of age, married; will not go to Me., N. H., Vt., West, South or to Canada; good reference.
6162, Textile World Record, Boston, Mass.

Overseer of Carding in woolen mill; has worked on blankets, knit goods, cassimeres and satinets; familiar with Davis & Furber, Lombard, Furbush, Cleveland and Whittle cards; 44 years of age, married; will go to Mass., R. I., Conn. and N. H.; good reference.
6163, Textile World Record, Boston, Mass.

Master Mechanic with second class engineer's license; has had experience also in steam and electrical works; 43 years of age; married; good reference.
6164, Textile World Record, Boston, Mass.

Overseer of Spinning in woolen mill; has worked on Davis & Furber and Johnson & Bassett machines; 40 years of age, married; will not go South or to Canada; good reference.
6165, Textile World Record, Boston, Mass.

Overseer of Carding in woolen mill; has worked on all kinds up to 9 run; familiar with Davis & Furber, Cleveland, Smith, Furbush, Lombard, Platt and Gatham cards; will not go West, South or to Canada; good reference.
6166, Textile World Record, Boston, Mass.

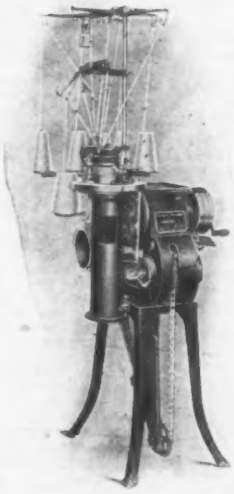
Sewing Machine Adjuster; has worked on ladies' underwear; familiar with Singer, Wilcox & Gibbs, Union Button, Merrow, Union Special and Metropolitan machines; will not go West, South or to Canada; 28 years of age; good reference.
6167, Textile World Record, Boston, Mass.

Overseer of Weaving in woolen mill; would consider good second hand position; has worked on all kinds of woolens and worsteds, also cotton worsteds; familiar with Knowles & Crompton, cotton worsted and woolen looms; 31 years of age, married; will not go to Me., Pa., N. Y., N. J., West, South or to Canada; good reference.
6168, Textile World Record, Boston, Mass.

Overseer of Weaving in woolen mill; has worked on plain and fancy worsteds, cotton worsteds, dress goods and fancy woolens; familiar with Knowles, Crompton & Knowles and Crompton & Thayer looms; 33 years of age, married; will not go South or to Canada; good reference.
6169, Textile World Record, Boston, Mass.

Here's the Machine that Saves 7 to 15 Cents a Dozen

On the Manufacturing Cost of Half Hose



IMPROVED MODEL F MACHINE

Isn't it interesting to you to know that our IMPROVED MODEL F MACHINE for making half hose will effect a saving in cost of manufacture of from 7 to 15 cents per dozen?

The machine is simple, requires no skilled operators, makes all qualities and gauges.

We will gladly send you samples and full information.

Established 1865

SCOTT & WILLIAMS, INC.

88 PEARL STREET, - BOSTON, MASS.

366 Broadway, New York 236 Chestnut St., Philadelphia 6 Devereux St., Utica, N. Y.

KNITTING MILL NEWS

New Mills.

Illinois, Chicago. Wittenberg & Goldberger, 3434 W. 16th St., who conduct a fancy bakery and confectionery business, are about to start in the knitting business, making jersey cloth. The product will be fulled and finished.

*Massachusetts, Cambridge. Construction work has been started on the new plant for the Hingham Knitting Company and it is expected the building will be equipped ready for the production of goods by July 1. The location of the new plant is at Sands, Akron, Banks Streets and Cambridge Parkway, near the plant of the Sterling Knit Goods Company, which went over to Cambridge from Boston a year or two ago. The equipment now operated at South Hingham will be moved to Cambridge and increases made which will give a total equipment of 60 knitting machines with complementary machinery including dyeing and finishing equipment for manufacturing men's half hose and women's seamless hosiery. Electric power will be used. The capital stock of this company is $25,000. Frederick E. Newell is president; John E. Woodside, treasurer, agent and buyer; and William E. Coppin, superintendent. The office is at 68 Essex St., Boston.

New Jersey, Trenton. S. Irvine Bell, 720 Chestnut St., Philadelphia, who has been in the mail order business for many years and who was formerly a hosiery manufacturer, has organized a company under the laws of New Jersey with authorized capital stock of $100,000 to manufacture and sell men's, women's and children's hosiery in various qualities, under the name of the Goodwear Hosiery Mills. The new concern is located at 143 E. State St., Trenton, and will have goods manufactured until a plant can be built. It is expected that work will be started on a mill during the coming fall or early in 1915. Mr. Bell is president and buyer of the new concern, and Wellington E. Breese is treasurer.

New York, New York City. Leo Rogovin, formerly connected with the Starr Knitting Works, 79 E. 130th St., is establishing a plant at 2315 Crotona Ave. for the manufacture of hockey caps and fancy knit goods under the name of the Peerless Mfg. Company.

*North Carolina, Elizabeth City. Officers have been elected by the new Pasquotank Hosiery Company as follows: Noah Burfoot, a local business man, president; F. V. Scott, vice-president; Dennis Van Horn, manager. These man constitute a committee to secure a suitable site for the plant and will at once look over available property. The company was recently organized with authorized capital stock of $50,000 and it was reported would begin manufacturing with a capacity of 300 pairs of hosiery per day.

*North Carolina, Halifax. The manufacture of ribbed hosiery will be started within 30 days by the Halifax Hosiery Mills, the new knitting project in which Archie McDowell, president of the Scotland Neck (N. C.) Cotton Mills, was recently reported interested. The new plant is really a department of the Scotland Neck Cotton Mills and all business is done through their office in Scotland Neck. Forty knitting machines will be operated at first.

North Carolina, Morganton. F. S. Drury, who has been operating a corn mill and saw mill here, which he cannot keep running for want of material, will install hosiery knitting machinery and manufacture hosiery on a small scale. The building has an 18 h. p. water privilege near Morganton and will need only knitting machines and complementary equipment. The dyeing and finishing will probably be done at the new plant of the Vaudois Knitting Mills, now being erected.

*North Carolina, Troy. It is expected the Troy Knitting Mills Company, organized some months ago, with capital stock of $35,000, will begin manufacturing July 1. Misses' and children's ribbed hosiery will be manufactured, dyed and finished. Electric and steam power will be used. J. C. Hurley is president and Barna Allen is treasurer and buyer.

*Pennsylvania, Nescopeck. A mill is to be built at once by Barger, Bains & Munn, Inc. of Philadelphia, on the site recently purchased in Nescopeck, and the mill will be in operation about the end of June. At the start 50 knitting machines will be installed for manufacturing boys' and misses' ribbed hosiery. Electric power will be used. The buying is done at the Philadelphia office of Barger, Bains & Munn, Inc., Jasper and Adams Sts.

Pennsylvania, Philadelphia. George M. Brown is starting up the North Penn Knitting Mills at 2809 W. Fletcher St. and will install 20 knitters, 5 loopers and 2 sewing machines on which he will manufacture a line of seamless hosiery, 200-220-needle goods, selling the production through G. A. Rumpf, 12th and Filbert Sts.

*Pennsylvania, Tower City. The Bestok Underwear Company, which was reported organized several months ago, is building a mill here and will begin manufacturing about July 1 with 10 knitting machines and 15 sewing machines, making ladies' union suits. Electric power will be used. The capital stock of the new company is $50,000. S. D. Bausher, of Hamburg, is president; J. B. Lesher, Williamstown, is treasurer and buyer. Hecht & Campe, Inc., New York, will sell the product. The office is at Williamstown.

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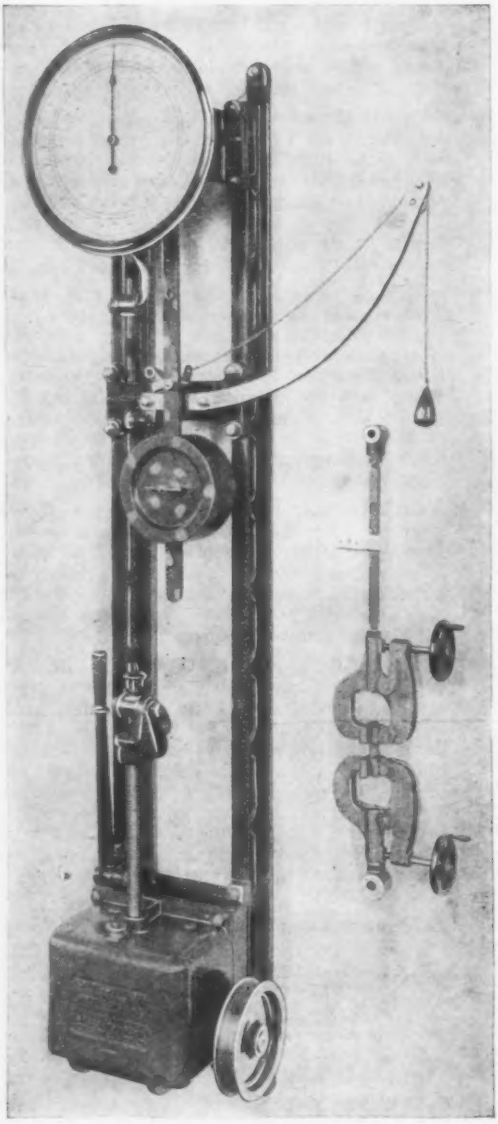
Enlargements and Improvements.

Canada, Ontario, Appleton. Last fall, Caldwell, Boyd & Co., Ltd., manufacturers of tweeds, blankets and other woven goods, installed a few hosiery knitting machines to manufacture heavy wool hosiery as an experiment to determine whether this line could be made profitably. Twenty-five knitting machines, three loopers, and a winder have now been installed in this department.

Canada, Ontario, Toronto. Four hosiery knitting machines for manufacturing plain wool socks have been installed in the plant of Joseph Simpson, Sons Ltd., manufacturers of sweater coats and underwear.

NEW COMBINATION
Automatic Power Driven Tester for Yarn and Cloth
EFFICIENT —— ACCURATE



Don't Guess at Results
Know Your Goods

THIS Combination Automatic Power Yarn and Cloth Tester is the first and only practical and thoroughly dependable machine for *both yarn and fabric* testing. It has that high degree of efficiency and accuracy expected by all who know and appreciate the "Scott Standard" in testing devices.

It depends upon the "dead weight" principle (or law of gravity) which never varies.

Being power-driven the speed is uniform throughout each test, and the operation is noiseless.

There is ample working space for quick handling and to avoid tangling of samples.

The spools are of the revolving type, heavily nickeled, and of the right size for all yarn testing.

The fabric testing clamps are of steel and facilitate the insertion of the fabric. Slipping or twisting is impossible. The anvils can be changed quickly for various widths and lengths.

The Tester is made entirely of metal and will always remain in perfect alignment.

The ball-bearing head is dust proof.

The quadrants are machine-cut and wear proof. There is no back play, no "give." There is a positive dead stop the instant the sample breaks. It can be reset instantly.

The bearings are of ample size to care for heavy loads.

The machine is entirely automatic in its action and there is no reason, if given good care, why it will not last for many years.

Write for Catalog C.

HENRY L. SCOTT CO., 223 Eddy Street, Providence, R. I.

KNITTING MILL NEWS

Canada, Ontario, Toronto. A hosiery manufacturing department to make men's and ladies' hosiery is being equipped by the Reliance Knitting Co., Ltd. This concern originally manufactured sweaters and fancy knit goods and several months ago added the manufacture of men's ribbed underwear. At present the equipment is 110 knitting machines and 50 sewing machines operated by electric power and giving employment to 175 hands. George R. Copping is president; F. R. Sweeney, secretary, treasurer and buyer; and B. H. Zimmerman, superintendent of manufacturing. 6s to 14s cotton, and 9s to 40s worsted yarns are bought.

Canada, Ontario, Wallaceburg. Additional machinery has been installed in the plant of the Wallaceburg Knitting Co., Ltd., manufacturers of men's wool hosiery, including 1 set of cards, 1 mule, and 8 knitting machines.

Illinois, Belleville. It is reported that additional knitting machines will be installed by the St. Clair Hosiery Mills. The plant was increased a few months ago and the capital stock doubled. Mercerized and silk half hose is manufactured.

Illinois, Fairfield. A number of additions and improvements have been made at the plant of the Sexton Mfg. Company, manufacturers of ribbed goods for seams for jean draws, also knitted webbing. New buildings have been erected as follows: A concrete warehouse, 160 by 125 feet, a building to be used for packing and shipping, 50 by 175 feet, and a recreation hall for employes. A complete sprinkler system has been installed in all of their buildings.

Minnesota, Minneapolis. Plans have been made for an 8-story addition, 300 by 100 feet, to the plant of the Northwestern Knitting Company and construction work will be started at once. This extension will be constructed in two units, the first of which will be completed August 1 and the second about January 1. Ground has already been cleared for the first unit, an old building in which the company began business twenty-four years ago having been torn down. This addition will cost about $250,000 and will provide for a rearrangement of some of the departments and also allow of the installation of new equipment which will give employment to 200 more hands besides making possible the enlargement of the quarters set apart by the concern for welfare purposes. The Northwestern Knitting Company manufactures men's, women's and children's ribbed underwear and has capital stock of $3,000,000. F. M. Stowell is president and buyer; C. S. Gold, treasurer; and Frank Chatfield, superintendent.

New York, Brooklyn. R. B. Nehrich, proprietor of the U. S. Knitting Works, 1056 Greene Ave., is in the market for woolen finishing machinery for fulling, shearing, etc. Sweaters and similar goods for men, women and children are manufactured.

New York, Little Falls. The Phoenix Underwear Company is rearranging its power department and the changes include the erection of a central power plant at the Ann St. mill. The electric drive equipment will be increased by the installation of ten motors.

New York, Stuyvesant Falls. New interests have come into the Crescent Knitting Mill and the business will be conducted in future under the ownership of Ashley & Wait. New machinery equipment has been ordered and new lines of gloves, hosiery, sweaters and fancy knit goods will be made.

*North Carolina, Elizabeth City. Contract has been awarded by the Elizabeth City Hosiery Company for the new Avalon Mill. The building will be 65 by 130 feet, and will be operated in connection with the Elizabeth City plant.

*North Carolina, Flat Rock. New machinery equipment including 50 knitting machines will be installed in the plant of the Skyland Hosiery Company by May 1, and will give total equipment of 200 knitting machines making men's and women's seamless hosiery in cotton and silk. The capital stock has been increased to $200,000.

North Carolina, Winston-Salem. An increase has been made in the capital stock of the P. H. Hanes Knitting Company to $2,000,000 for the purpose of constructing additional buildings and greatly enlarging the business. The company is not ready to announce details. Men's ribbed cotton underwear is manufactured on present equipment of 10,000 ring spindles, 120 latch-needle knitting machines, and 250 sewing machines, dyeing and finishing equipment, steam and electric power equipment, etc. P. H. Hanes is president, and P. H. Hanes, Jr., is treasurer, general manager and buyer.

Pennsylvania, Lewistown. Thompson Bros., proprietors of the Lewistown Knitting Company, are installing new knitting machines. Hosiery is manufactured and another factory is operated at Milroy. A night and day schedule has been in force for some time.

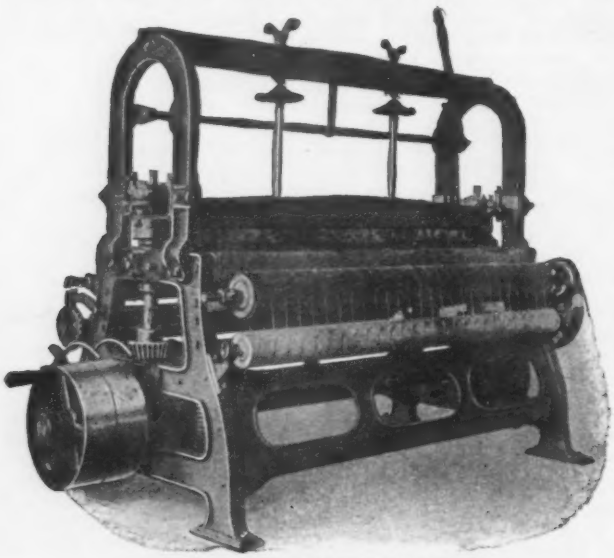
Pennsylvania, Philadelphia. John Blood & Bro., Inc., manufacturers of ladies' ribbed underwear at Trenton Ave. and Allegheny Ave., and bleachers of knitted fabrics for the trade, have recently placed a contract with a local builder for the erection of a one-story brick building at the N. E. Cor. of Clearfield and Witte St., to cost $7,500, the work to be started at once.

Pennsylvania, Philadelphia. The Casten Hosiery Mills, recently started up at 265 S. 4th St., are arranging for the installation of a dyeing and finishing plant for the purpose of dyeing and finishing their own production.

Pennsylvania, Philadelphia. Francis H. Mayhew, operating a plant at 397 Bridge St., Brooklyn, N. Y., has consolidated with and removed his plant to that of Harry Elwell, 1543 Ruan St., Frankford, where he is operating 40 circular machines and 1 flat knitter on knitted neckwear and mufflers, using art. and natural silk.

Tennessee, Lenoir City. Two motors have been installed in the spinning department of the Holston Mfg. Company and a further installation is contemplated depending upon the results of the two motors already installed.

CHINCHILLA MACHINE



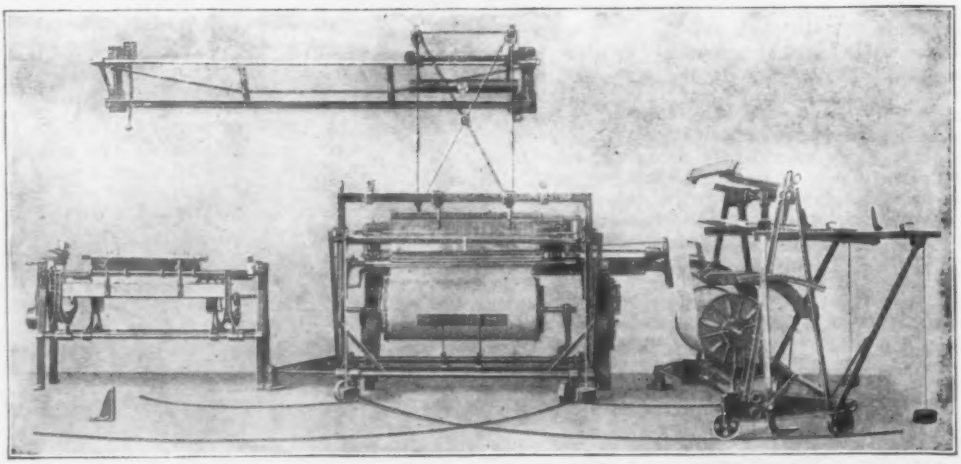
For producing
the following finishes:

Chinchilla
Petersham
Ratine
Crepe and
Whitneys

ALSO MANUFACTURERS OF
Tentering and Drying Machines, Crabbing Machines, Cloth Washers, Whipping Machines, Etc.

Manufactured by
D. R. Kenyon & Son
Raritan, N. J.

WARP TYING MACHINES



A DIRECT SAVING IN THE DRAWING-IN DEPARTMENT AN INCREASE IN WEAVE ROOM PRODUCTION

BARBER-COLMAN COMPANY
ROCKFORD, ILL. BOSTON, MASS. GREENVILLE, S. C.

SILK MILL NEWS

*Pennsylvania, Lancaster. The previously reported addition to the plant of Follmer, Clogg & Co., manufacturers of umbrella and parasol silks, consists of building another story on the silk mill, which will be used for warping and winding, and the installation of about 60 additional looms bringing the total number of looms up to 300.

Pennsylvania, Lehighton. Additional machinery has been purchased by the Carbon Silk Mill Company, silk throwsters and quillers. The plant is being operated on a night and day schedule. P. F. Rehrig is buyer.

Pennsylvania, Reading. The Quaker Silk Mills, manufacturers of plain and fancy broad silks, will take over the entire 4-story building at Second and Buttonwood Streets and install 75 additional looms, giving approximately 200 looms. At present three floors of the building are leased. B. Edmund David is proprietor.

Pennsylvania, Stroudsburg. Lippman & Abrash, manufacturers of broad silks, are moving their plant from their old building into a new one.

*Pennsylvania, Towanda. Eighty more looms are to be added by the Hartley Silk Mfg. Company when the addition now under construction is completed.

*Pennsylvania, York. New silk throwing machinery for the Diamond Mill of the Pennsylvania Textile Company is expected to arrive within a week or ten days and the throwing capacity will be doubled. The mill is expected to be in full operation in about six weeks. Another change to be made is the changing over to electric power and the discarding of a large part of the shafting and belting. The electric plant to be installed will be of about 600 h. p. With the removal of the finishing plant from the York Mill to the Clifton Mill at Weehawken, N. J., additional looms are to be installed to fill up the mill and twenty-five of the new looms are now being installed.

*Rhode Island, Central Falls. Work has been started on the addition to the plant of the Leader Weaving Company, manufacturers of silk and silk and cotton fabrics. One hundred looms will be installed in this addition in May and June.

Rhode Island, Pawtucket. A new 2-story mill about 500 feet long and 100 feet wide is to be built as an addition to the Royal Weaving Company, manufacturers of cotton back satins and silk stripe sleeve linings and cotton yarns. The new building will be used for weaving, according to report, and will be so arranged that it can be converted into a spooling and warping department later on should a further development of the plant make a change of that nature desirable. Construction work on the foundation has just been started and the building will be completed as soon as possible. It is estimated that there will be an addition to the working force of nearly 500 hands and that the enlargement will represent an investment of about a quarter of a million dollars and will increase the output about 25 per cent.

.....

Mills Starting Up.

*New York, Olean. Dunlop Bros. of Spring Valley, N. Y., advise that they have leased the

The Kemp System

of Applying Gas for Fuel Purposes

Automatically controlled at minimum cost of supply and operation. No waste. No delay. Always ready and sure.

Singes closer, faster and more uniformly with 25 to 50% less consumption of gas.

Invaluable in all mechanical processes and operations where uniformity of pressure, flame consistency, temperature and reliability are factors.

Will pay for itself in quick earnings and its installation will be one of your

Best Investments.

Ask us for further information about the use of the Kemp Gas System. We have valuable first hand knowledge of its use in mills throughout America, and will be glad to assist you to solve your problems.

Write for our catalog.
It contains full description and drawings

C. M. KEMP MFG. CO.

415 Oliver Street, Baltimore, Md.

For Hosiery, Underwear and Other Knit Goods in the Garment

The HUNT

Pusher Scouring and Fulling Mill

Other Designs, including Tom Tom and Rotary Mills for goods in the string, for paper makers, piano, boot, shoe and other felts, also for woolens and worsteds.

RODNEY HUNT MACHINE CO.

Main Office and Works, - Orange, Mass.

Boston Office - - - 70 Kilby Street

For All Mill Needs—Get the All Steel Fan

A Perkins Ventilating Fan

Is Superior Because:

1 The frames, drums, arms, shafts, etc., are STEEL—not iron.

2 The blades are adjustable—can be set to any desired angle—to blow in or out.

3 It can be run at high speed—and will run longer without oiling than any other fan on the market—on account of the *self-oiling journal boxes.*

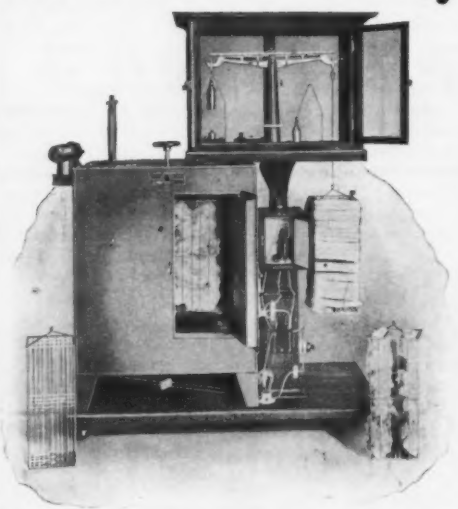
Write for Catalog 85B

B. F. PERKINS & SON, INC.

HOLYOKE, MASS.

Power Transmission Systems built and installed for driving any fan in any position desired.

Moisture is Money



The weight of all raw and finished textile products varies with moisture.

The size of all yarns varies with moisture.

The strength of all yarns and fabrics varies with moisture.

The value and quality of all textile products vary with moisture.

Moisture is money. If you do not watch it you will lose money every day.

Use a Conditioning Oven and know exactly what you are doing.

Emerson Apparatus Company,

251 Causeway Street, - Boston, Mass.

SILK MILL NEWS

plant of the Feder Silk Throwing Company and if labor conditions prove satisfactory will operate the plant indefinitely.

Pennsylvania, Tamaqua. Manufacturing has been started by the new Pennsylvania Silk Spinning Company located on Railroad Ave.

MISCELLANEOUS.

.....

Canada, Ontario, Gravenhurst. Flax Towels, Ltd. is the name of a new company which has just been organized with capital stock of $100,000 for the purpose of building a plant here and manufacturing towels from flax straw. It is reported that a linseed oil mill also will be constructed and that later other classes of textile fabrics will be made.

*Canada, Ontario, Niagara Falls. A charter has been granted the Canadian Niagara Linens, Ltd., with authorized capital stock of $300,000. It has been noted in previous reports that this company was being organized to establish a linen manufacturing plant. A. Fergusson Macintyre, who was for a number of years cost accountant at the Montreal Cottons, Ltd., at Valleyfield, Quebec, came here from the Niagara Falls Linen Company at Niagara Falls, N. Y., where he was one of the officers, to manage this new concern. A plant is to be erected to manufacture household and dress linens and to bleach, dye and finish. An office has been opened at 24 Empire Bldg., and attention is being given to plans for the projected mill which will be located on Fourth Ave. Electric power will be used from the lines of the Ontario Power Co.

Canada, Ontario, St. Catharine's. Manufacturing has been started in the new plant of the Canadian Flax Mills, Ltd. Flax fibers and tow are produced. Later a spinning department may be added. The main office is at Toronto.

Canada, Quebec, Coaticook. Charles Niedner's Sons, of Malden, Mass., manufacturers of linen fire hose, cotton tubings, razor strop fabrics, and similar goods, have removed their Canadian branch from Montreal to Coaticook. The present quarters in Coaticook are temporary. The town has granted certain concessions to the company for the erection of a factory building and operations will be commenced early in May on the new plant.

*New Jersey, Paterson. A 2-story building and a second building, which will be 3 stories in height, both of brick and steel construction and covering about 32,000 square feet, are to be built to the plant of the Royal Piece Dyeing Company. The name of this concern was changed from the Cadgene Silk Dyeing & Finishing Company in February.

New Jersey, Paterson. A new dye house is to be built on lower Van Houten St. for the Standard Silk Dyeing Company, dyers of skein silks. George W. Cole, Jr., is president and treasurer, and Charles P. Cole is vice-president.

This Fall River Bleachery truck is one of many KisselKar Trucks employed by textile manufacturers.

We have a KisselKar Truck that will exactly meet your needs—

The business man who has been doubtful about motor trucks meeting the demands of his particular business should investigate the new series of KisselKar Trucks.

There are six sizes--1500 lbs., 1, 1½, 2½, 3½ and 6 tons. Bodies are built to order, so there is no delivery duty into which a KisselKar Truck will not fit.

You are not asked to readjust your delivery system to the truck-just tell us what you want to haul and we'll furnish a truck that will do the work expeditiously and economically.

Mechanically, no trucks are better than KisselKar Trucks. Compare them, point by point, with others, and then ask present owners for their experiences.

Send for the new truck book with 350 illustrations of KisselKar Trucks in actual use–it's free to you for the asking. Write now while it is on your mind.

Kissel Motor Car Company

528 Kissel Ave., Hartford, Wis.

New York, Boston, Minneapolis, St. Paul, Chicago St. Louis, Philadelphia, Pittsburg, Kansas City Los Angeles, San Francisco, Oakland, Dallas and 350 other American and Canadian Points.

KISSELKAR TRUCKS

WILLIAM FIRTH

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SOLE IMPORTER OF

ASA LEES & CO., Limited

TEXTILE MACHINERY

OF EVERY DESCRIPTION FOR COTTON, WOOLEN AND WORSTED.

Sole Agents for

JOSEPH STUBBS. Gassing, Winding and Reeling Machinery for Cotton, Worsted and Silk.
GEO. ORME & CO., Patent Hank Indicators, etc.
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JOSEPH SYKES BROS., Hardened and Tempered Steel Card Clothing for Cotton.
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COTTON CORD AND VELVET CUTTING MACHINE CO., Corduroy Cutting Machines, etc.

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BIRCH COTTON FINISHING MACHINERY

Scutchers	Washing	Sewing
Angular Guides	Dyeing	Singeing
Conical Openers	Squeezing	Mangles
Stretchers	Folders	Engines
Open Soapers	Rollers	Napping

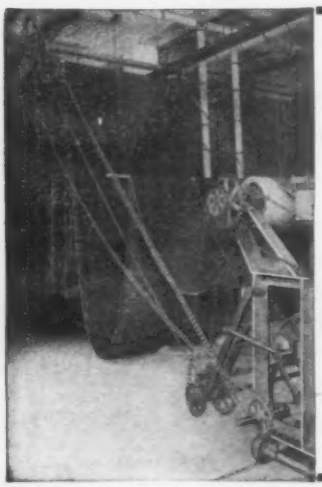
THE BIRCH WOOLEN WORSTED FINISHING MACHINERY

Crabbing	Steam Finishing	Cloth Openers
Piece Dyeing	Steam Blowing	Folders
Singeing	Sewing	Squeezing
Tentering	Tacking	Napping

BIRCH BROTHERS

ALBERT BIRCH, Textile Mechanician

SOMERVILLE MACHINE WORKS, SOMERVILLE, MASS.



RELIANCE CLOTH HANGING MACHINE

For shrinking woolen, worsted and cotton goods; drying oilcloth, or waterproof cloth, and curing rubberized cloth.

Can be attached to any machine or operated separately

In use by the United States Quartermaster **department** for shrinking uniform cloth.

Write for catalogue and prices

Reliance Machine Works

Frankford, Phila.

SILK MILL NEWS

New York, Auburn. Contract has been awarded by the Columbian Rope Company to John W. Ferguson Company, Paterson, N. J., for the construction of a 5-story and basement storehouse for the finished goods which will adjoin the jute mill of the concern. This storehouse, which is from the designs of Charles T. Main, Boston, will measure 120 feet each way, the shape being that of a trapezoid. The building will be of reinforced concrete with mushroom columns on the inside and brick walls on the outside, every precaution being made to prevent the spread of fire in the inflammable goods to be stored, including automatic sprinklers throughout the automatic fire doors.

*New York, Lockport. Additions to be made by the Niagara Textile Company include a new bleach house and a 2-story addition, 65 by 175 feet. It was noted recently that property has been purchased to provide space for these enlargements. The Niagara Textile Company manufactures the Niagara linen and union towels and crashes. Calvin G. Sutliff is president; William A. Williams, vice-president, and Willard T. Ransom, secretary and treasurer.

Pennsylvania, Philadelphia. The Westmoreland Dye Works recently placed a contract for the erection of an addition, one story of brick. They are dyers of woolen and worsted piece goods and raw stock at Jasper and Westmoreland Sts.

*Pennsylvania, Philadelphia. The Pennsylvania Silk Dyeing & Finishing Co., reported by us as about to incorporate, is capitalized at $20,000 and has for its officers, Andrew Demetre, president and manager, and A. Veluard, treasurer, superintendent and buyer. The plant, which is equipped and now in operation, will be run on woolen, cotton and silk fabrics of all kinds.

Pennsylvania, Philadelphia. A charter will be asked for the Pennsylvania Silk Dyeing & Finishing Co., with Andrew Demetre, Jules Demetre, Andre Veluard, Louis B. Randolph and John G. Stewart as incorporators, the company commencing its operations in Frankford, where a new building at Leiper and Adams Sts. is being equipped with machinery for the dyeing and finishing of silk fabrics.

Pennsylvania, Philadelphia. Work has been started on alterations and additions to the plant of the John T. Bailey Co., located at Water, Mor-

If Your Dryers Handle Inflammable Goods

It is absolutely essential that the bearings run cool and easy, and that leakage of lubricant be avoided. These features have a direct bearing on the fire hazard, hence many textile manufacturers are safeguarding their mills by specifying

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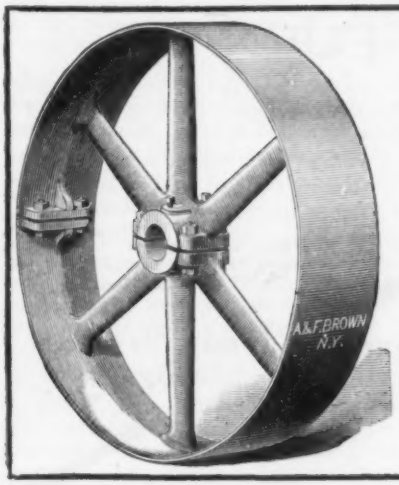

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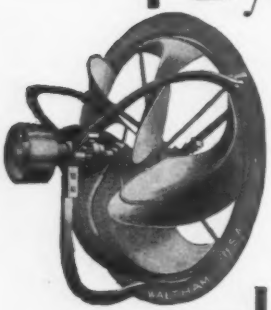

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148

SILK MILL NEWS

ris, Tasker and Delaware Ave. The contracts include the erection of a building of brick, concrete and steel, 400 feet long, and will cost it is said about $50,000. Rope and twine are manufactured.

Pennsylvania, Philadelphia. Brehm & Stehle, dyers of cotton and woolen yarns at Trenton Ave. and Allegheny Ave., have contracted for the erection of a building three stories high, of brick, 24 by 40 feet, which they propose using as an engine house. The work has been started and will be pushed to completion as speedy as possible.

Pennsylvania, Philadelphia. Larger quarters having been secured, the G. Joseph Silk Winding & Embroidery Works have removed from 526 Jefferson St. to 1127 Frankford Ave.

Pennsylvania, Philadelphia. The Roberts Embroidery Company, 3623 Lawrence St., have recently contracted for the erection of a one story brick building, 60 by 104 feet, to adjoin their present plant. They are manufacturers of silk, cotton and mercerized embroideries, operating their plant by electricity and selling direct.

Pennsylvania, Philadelphia. The General Processing Co., Willard and Collins Sts., mercerizers, dyers, bleachers and winders, are dismantling their hosiery dyeing department for the purpose of enlarging their mercerizing department. New machinery is being installed which will enable them to turn out a larger production. They are very busy on all lines at this time.

Pennsylvania, Philadelphia. The Philadelphia Tapestry Mills, manufacturers of upholstery fabrics at Front and Allegheny Ave., are arranging for the erection of a one-story addition, 44 by 63 feet, to their present plant. Plans have already been prepared and bids are now being asked.

*Pennsylvania, Williamsport. Contract for the construction of the previously reported addition to the plant of the National Silk Dyeing Company has been awarded to Harman Bros. It is understood the capacity of the plant will be increased about one-third.

Rhode Island, Pawtucket. The LeBon Bleach & Dye Works, 1115 Central Ave., bleachers and dyers of cotton and mercerized yarns, narrow fabrics, etc., are installing two new Hussong yarn dyeing machines for sulphur blacks.

Rhode Island, Pawtucket. The Pawtucket Warp Company has removed from 48 Hughes Ave. to the property known as the Atherton property on Prairie Ave., where the entire second floor is occupied.

*Rhode Island, Valley Falls. Manufacturing will begin in about three weeks in the plant of Burgess-Joyal Corp., recently organized with capital stock of $10,000. Machinery for quilling cotton and silk yarns on tubes or bobbins for the weaving and knitting trades is being installed at 197 Broad St. Electric power will be used. The new company will start on a small scale and expects to enlarge as the business grows. In connection with the quilling plant they will have a remnant store. Pierre Joyal is president and superintendent, and Charles Burgess is treasurer and buyer.

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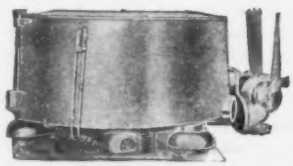

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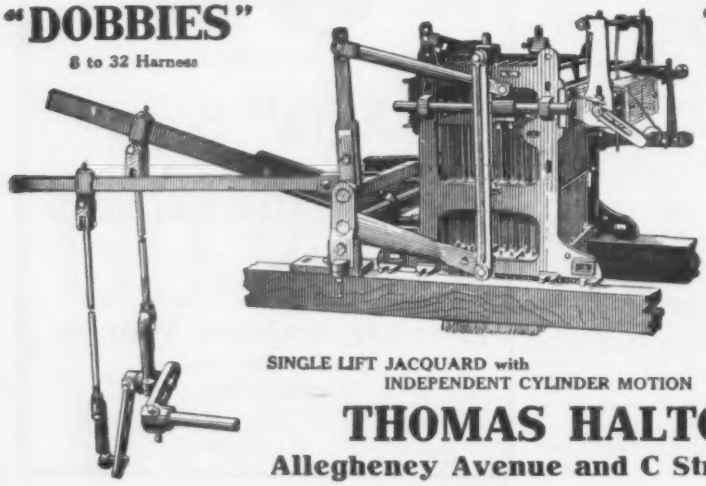

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FACTS AND GOSSIP.

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*Canada, Ontario, Brantford. The Niagara Silk Mills state that as yet nothing definite has been settled with relation to the project of their establishing a Canadian branch. The matter is being considered. It was noted in a previous report that Lloyd D. Barber, an architect of Brantford, was preparing plans for a 3-story mill building, 165 by 52 feet, to be erected at Sarah and Drummond Sts., Brantford. Last December the capital stock of the Niagara Silk Mills was increased to $1,500,000.

*Canada, Ontario, Gravenhurst. A. C. Meldrum, of Gravenhurst, is managing director of Flax Towels, Ltd., recently reported organized with capital stock of $100,000 to manufacture linen towels and coarse linens. The other directors are Dr. J. A. C. Grant. D. Campbell, and George E. Clipsham.

Connecticut, Derby. The trustee of the Derby Fur Fabric Company will sell the assets. The plant is closed.

Connecticut, Killingly. The Killingly Mfg. Company is running to the full capacity of its present equipment, some of the departments being run overtime. Automobile tire fabric is manufactured.

Connecticut, Shelton. A representative of a textile company located on Long Island was at Shelton recently looking over the field with a view to securing a factory site.

Connecticut, Shelton. It has been definitely settled that the Specialty Weaving Company will not leave Shelton for the present but will continue to occupy until fall, at least, the two lower floors of the mill. The property has been purchased by Sidney Blumenthal & Company, as noted previously.

Connecticut, Watertown. An increase has been made in the capital stock of M. Heminway & Sons Silk Company to $600.000.

Connecticut, Winnipauk. The woolen equipment is being taken out of the Norwalk Woolen Mills and sold. As noted in previous reports the buildings have been leased to the Norwalk Tire & Rubber Company, Inc., and alterations will be made to adapt the property to their business.

Delaware, Wilmington. A charter has been granted the American Hair Felt Company under the laws of Delaware with capital stock of $1,000,000.

Delaware, Wilmington. Report has it that Hodgson Bros., operating 2 cards, 2 combs and 2,000 spindles on worsted yarns, Bradford system, at Henry Clay, a suburb of this town, are seeking another location for their plant, where a larger building can be secured and their equipment increased.

*Georgia, Cedartown. Plans are being made to organize the projected new cotton yarn company with capital stock of $250,000. Local business men have subscribed $20,000 and arrangements have been made to place the rest of the capital stock.

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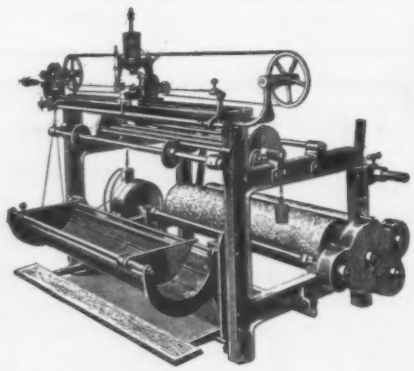

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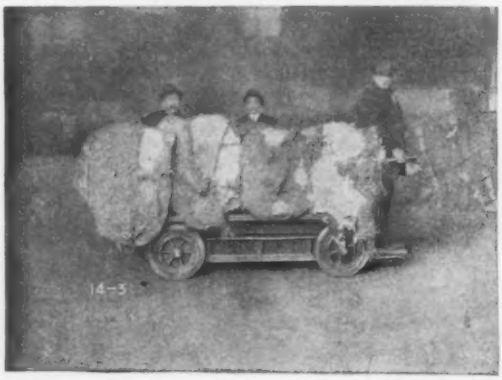

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FACTS AND GOSSIP.

As noted in a previous report, the buildings formerly occupied by the Cedarton Knitting Company will be occupied after enlargements and improvements are completed and about 17,000 spindles will be installed for making 24s to 40s yarns.

Georgia, Elberton. The Home Cotton Mills were not sold on April 7 as ordered by the stockholders. The plant will not be operated again by its present owners but will be sold at an early date to parties who will operate it. The property will again be offered for sale on Tuesday, May 5, when it is expected the parties interested in starting up the mill will secure it.

Georgia, High Shoals. The High Shoals Mfg. Company has shut down its weaving department and is devoting all its energies to manufacturing yarns for the market.

Kentucky, Paducah. The Paducah branch of the Mayfield Woolen Mills is to be practically doubled in size. This department manufactures clothing using the fabrics made at the woolen mill in Mayfield.

*Massachusetts, East Braintree. Good progress is being made on the alterations and improvements at the old braid factory property which has been purchased by the East Braintree Bleachery & Dye Works, Henry McCusker, proprietor. It is expected to begin operations dyeing, bleaching and finishing cotton piece goods about July 1.

Massachusetts, Fall River. The loss sustained by the Providence Yarn Company in the recent fire which destroyed the plant of the concern has been adjusted for the sum of $56,443.

Massachusetts, Fall River. Wendell E. Turner, treasurer and agent of the Massasoit Mfg. Company, has purchased from the Fall River Iron Works Company the property known as the old Robeson Print Works and adjacent property extending from the Pocasset Mfg. Company's main plant, west to Camden St. and Pocasset St. It is reported that Mr. Turner made the purchase on his own account. The property contains 432 square rods of land and 8 buildings.

Massachusetts, Indian Orchard. The Hodges Fibre Carpet Company has been incorporated under the laws of Massachusetts with authorized capital stock of $1,000,000. Henry J. Beebe continues as president.

Massachusetts, Lowell. A new corporation has been organized under the name of the Belvidere Woolen Company to succeed the Belvidere Woolen Mfg. Company, operating the Belvidere Woolen Mill on Lawrence St. The capital stock of the new company is $60,000. The officers are S. Parker Bremer, president; Eben L. Baker, treasurer; Royal P. White, superintendent. Parker, Wilder & Co., Boston, are the selling agents and also attend to the buying. Nine sets of cards and 60 looms are operated on woolen dress goods and flannels.

Massachusetts, Lowell. The New Hampshire worsted mill which has been seeking a location in Lowell through a local real estate agent, has decided to go elsewhere as sufficient inducements

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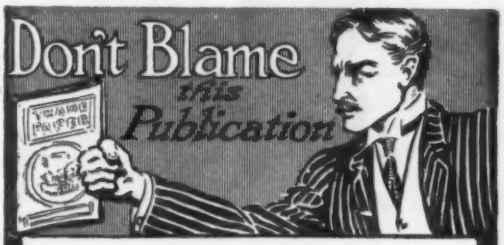

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FACTS AND GOSSIP.

were not offered, it is understood. According to reports from Philadelphia the project may be located in that city.

Massachusetts, Lowell. The Board of Trade has apointed a special committee to consider the project for the establishment of a plant in Lowell for the manufacture of artificial silk. It is reported the promoters are seeking the investment of $200,000 of Lowell capital to finance the project.

Massachusetts, New Bedford. An acre and a half of land adjoining its plant has been acquired by the Beacon Mfg. Company to provide for future developments.

Massachusetts, North Billerica. The Talbot Mills have resumed manufacturing after a shut down of a few days while considerable repair work was done on one of the boilers. Recently there has been some overtime work in some of the departments.

Massachusetts, Pittsfield. Parts of the plant of the Berkshire Woolen & Worsted Company are running overtime and the yarn department is being run all night.

*Massachusetts, Worcester. The Bancroft Textile Co., recently reported incorporated with capital stock of $50,000, have taken over the plant of H. M. Witter & Co., Park Ave., and will continue the manufacture of tapes, bindings, edgings, etc. It is proposed later to add the manufacture of other goods. The officers of the new company are Arthur O. Berry, president; Harold A. Johnson, vice-president and manager; and Charles W. Russell, treasurer. Messrs. Russell and Johnson are practical men in the narrow fabric line and Mr. Johnson is to give his entire personal attention to the manufacturing end of the business.

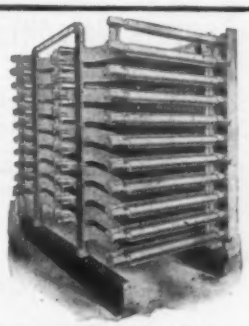
Massachusetts, Worcester. A company doing business here under the name of the New England Fibre Blanket Company has purchased the property known as the Smith-Green Block at the corner of Shrewsberry and Mulberry Sts. The building is 5 stories high and with the land has an assessed valuation of $35,400. Alterations will be made and the building will then be used in part for the manufacture of fiber blankets. The capital stock of the company, which is a Massachusetts corporation, has been increased from $35,000 to $60,000.

New Hampshire, Hookset. All the machinery in the Dundee Mills is running again and the danger of trouble from high water is past.

New Jersey, Paterson. The Textile Printing Company has been organized with capital stock of $10,000 to succeed to the business of Louis Schmerber. The incorporators are Louis Schmerber and Joseph A. Pellegrim.

*New Jersey, Paterson. The office of the Hosper Silk Company, recently incorporated to carry on a business of silk throwing, is at 140 Market St., Emile Coene in charge.

New Jersey, Paterson. Weavers in the employ of the Henbert Silk Company have left their work following a disagreement with their employers. A 5 per cent. increase in wages is asked.



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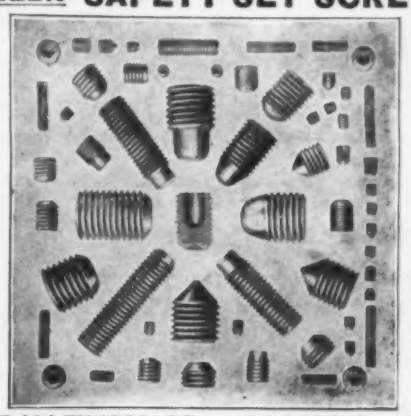

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FOR
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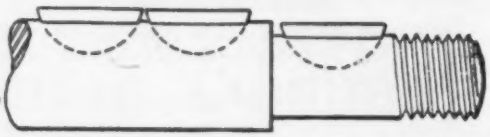

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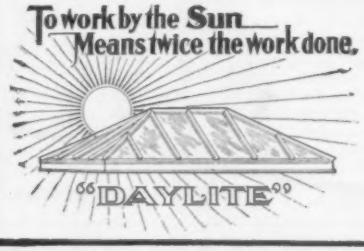

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ARTHUR BIRCH, Proprietor

Arlington Heights (near Boston), Mass.

FACTS AND GOSSIP.

New York, Theresa. A new company known as the Indian River Silk Company, recently organized with capital stock of $10,000, has taken over the plant of the Lincoln Silk Company. The New York office of the concern is at 381 4th Ave.

*North Carolina, Belmont. A. C. Lineberger has not completed details of the projected new mill. Mr. Lineberger is president of the three cotton mills here, all of which manufacture cotton yarns.

North Carolina, Fayetteville. The product of the Cape Fear Cotton Mills is to be changed from single yarns to two ply warps.

North Carolina, Kannapolis. The offices of the Cabarrus Cotton Mills are being moved from Concord to the new mill recently built in Kannapolis.

North Carolina, Raleigh. Contract for rebuilding the North Carolina Textile School department of Agricultural and Mechanical College at West Raleigh, has been awarded to S. S. Toler, of Rocky Mount, and the building is expected to be completed ready for equipment August 1. Manufacturers of textile machinery in all parts of the country are again asked to contribute machinery for instruction purposes.

North Carolina, Tarboro. C. A. Johnson and H. P. Foxhall will sell the property of the Tarboro Cotton Factory at auction on June 1. The mill has been closed for some time.

Pennsylvania, Altoona. The Imperial Dye Works, Inc., recently granted a charter, does a business of cleaning and dyeing.

Pennsylvania, Avoca. It seems to be an assured fact that within the next few months a new silk mill will be established here. John Ramsey of Shamokin is interested.

Pennsylvania, Bridgeport. William Barber, manufacturer of woolen and Bradford spun worsted yarns, has recently disposed of his worsted yarn equipment to other parties who will start it up in the same building under the name of the Integrity Worsted Spinning Mills. The plant contains 1,000 worsted spindles, operated on yarns up to 30s.

Pennsylvania, Chester. Fred Wolstenholme, of Philadelphia, has taken over the Emmott Worsted Spinning Company, and will reorganize it under the name of the Thurlow Worsted Mills. Mr. Wolstenholme will be president and treasurer and the main office will be located at 26 Letitia St., Philadelphia. Edwin Emmott will be retained as superintendent. The plant contains 4 sets of cards, 3 combs and 2,700 spindles, and Bradford spun worsted yarns up to 30s will be manufactured and sold direct.

Pennsylvania, Mount Joy. The Valley Carpet Manufactory, Peter Smith, superintendent and buyer, has rented a building in Mt. Joy for one year and will move the plant from Shippensburg. Rag, jute and Venetian rugs and carpets are manufactured on four looms.

Pennsylvania, Philadelphia. It is reported locally that a worsted mill located in New Hampshire which has a weekly pay roll of $2,500, and has been running for about four years, will move its plant to Philadelphia.

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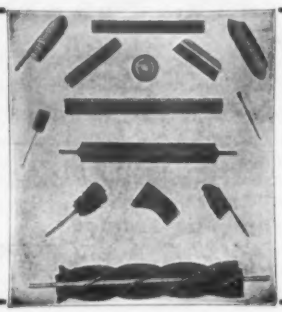
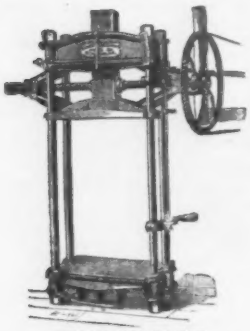


Mason Brush Works

Worcester, Mass.

Agt. and Mgr.
CHAS. A. O'NEIL



KNUCKLE JOINT

Boomer & Boschert

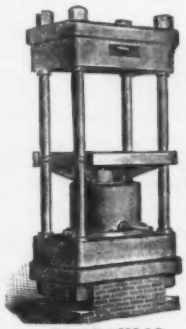
BALING PRESSES

ARE THE STANDARD

Hydraulic or Knuckle Joint
Any Size Any Power

Boomer & Boschert Press Co.

338 WEST WATER ST., SYRACUSE, N. Y.



HYDRAULIC.

ASHWORTH BROS.,

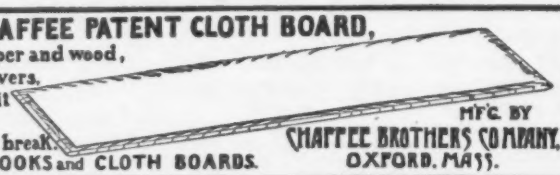
—MANUFACTURERS OF—

Card Clothing of Every Description

FALL RIVER, MASS.

SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,
Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.
BOX SHOOKS and CLOTH BOARDS.



MFG. BY
CHAFFEE BROTHERS COMPANY,
OXFORD, MASS.

Clean
LIGHT
Strong

Thread and Silk SPOOLS of any description

Made from one piece, up to 6″ long and 3″ dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted

E. L. Tebbets Spool Company, Locke's Mills, Maine

ANY MILL BRUSH YOU WANT

of good, durable quality, correct shape and finish, at prices based on a business of many sales, at prices that bring repeat orders—can be had of us, for—

WE ARE HEADQUARTERS

S. A. FELTON & SON CO., Manchester, N. H.

Loom Duster

JUST ONE

OF THE MANY MADE FOR YOU

JOHN E. KENDRICK, President MYRON FISH, Treasurer M. C. FISH, Secretary

American Supply Co.

Manufacturers of Reeds, Harness, Belting and General Mill Supplies

We make a specialty of Harness for American Warp Drawing-in Machine

OFFICE and STORE—135-137 Washington St., Providence, R. I. FACTORIES—Central Falls, R. I. and Fall River, Mass.

DIXON PATENT STIRRUP ADJUSTING SADDLE

1,200,000 pairs now in use

Best Saddle for Top Rolls of Spinning Frames

Send for Samples

DIXON LUBRICATING SADDLE CO., Bristol, R. I.

Manufacturers of all kinds of Saddles, Stirrups and Levers

FACTS AND GOSSIP.

*New Jersey, Paterson. The Fiory Dyeing & Printing Company, recently reported incorporated with capital stock of $50,000, conducts a business of dyeing and printing artificial silk, silk ribbons, etc., at 71 Butler St., succeeding C. Fiory & Company.

New Jersey, Paterson. The plant of the Atlas Silk Company, located in the Strange Mill, has been purchased by S. Cominsky, recently reported interested in establishing a new plant. Mr. Cominsky is operating under the name of the K. R. H. Silk Company. Ten looms for weaving broad silks are operated and the space will accommodate double this equipment.

New Jersey, Union Hill. A charter has been granted R. & H. Simon Company to manufacture silk and other textile fabrics. The incorporators are Elizabeth M. Simon, Charles M. Muller and Grace Bieler. In the will of Herman Simon, who was the sole owner of the business of R. & H. Simon, it was directed that a corporation should be formed under the style of R. & H. Simon Company for the purpose of perpetuating the business. The largest stockholder is Elizabeth M. Simon, widow of Herman Simon. Charles M. Muller, general manager of the plants, is the largest stockholder actively connected with the business.

*New Jersey, West New York. The Catoir Silk Company of New York City does not expect to occupy their new mill being built here until August 1. No new machinery will be installed or ordered until their present equipment is moved from New York City.

New Jersey, West New York. Abe Yolken, 734 Broadway, is interested in starting a broad silk plant of about 10 looms.

New York, Gouverneur. The Perfect Silk Throwing Company, of Shamokin, Pa, may establish a branch in Gouverneur. J. S. Knepka recently was here in the interests of the project.

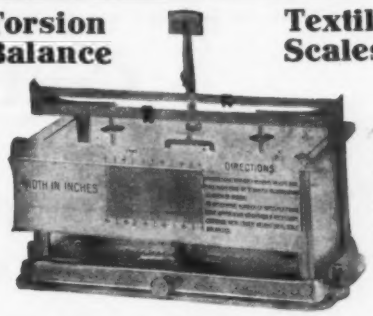
*New York, Kingston. The foundations have been laid for the building for the Art Silk Yarn Company and work will be started on the brick work at once. It is hoped to be ready for manufacturing by August 1.

New York, New York City. The Niagara Falls (N. Y.) Linen Company has opened a New York office at 396 Broadway.

New York, New York City. A company has been organized under the name of Taylor, Armitage & Company, Inc., with capital stock of $500,000 by Myron C. Taylor, J. D. Armitage, and Richard P. Eagles, all of 346 Broadway, N. Y., to sell the products of the American Textilose Company of Newburyport, Mass., and the Passaic Cotton Mills.

*New York, New York City. The Great Northern Cotton Waste Company, Inc., recently organized as noted, represents a German manufacturer, and buys and sells cotton waste. The concern is located at 299 Madison Ave.

Torsion Balance Textile Scales

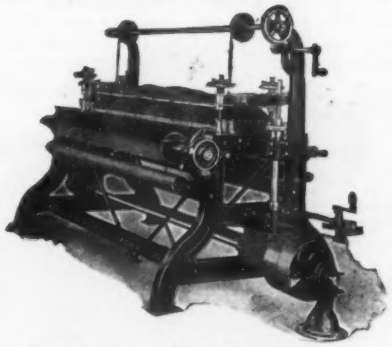


These Scales have revolutionized Textile Testing. Determinations obtained without calculation or the use of weights.

Scales for the following purposes: Number of yards per pound; number of ounces per yard; size number of cotton, woolen or worsted yarns; exact weight per pair and per dozen pair of hose. Dye scales for sample batches.

THE TORSION BALANCE COMPANY
Factory and Works, Jersey City, N. J. Office, 92 Reade St., New York

CURTIS & MARBLE MCH. CO. WORCESTER MASS.



Latest Improved Chinchilla Machine

"CORONATION"

BIRCH TREE.

Piece-End Sewing Machine

sent on trial most anywhere

Sews any Fabric Thick or Thin, Wet or Dry Without Change. Fine Stitch or Coarse Stitch.

Send for circular

BIRCH BROS.
Somerville, - Mass.
Also Finishing Machinery

Cutting Dies

— FOR —

"Straight Line" Cloth Analysis

And Determining Average Yarn Number of Fabrics

The "straight line" method of cloth analysis has been used by us for years. It is equally well adapted for cotton, woolen, worsted or linen fabrics.

The value of this method is conclusively demonstrated by the fact that the U. S. Treasury Department has recommended it to Customs Collectors and Appraisers as the simplest method of determining the average yarn number on which the tariff on cotton cloth is based.

The sample having an area of 1/300th square yard (4.32 square inches) can be cut in any form desired. The rectangular die shown in the illustration is what we have found convenient.

For the convenience of the trade we have arranged to supply dies like this at **$5.00** each, express paid. This includes instructions for use.

Having cut a sample of cloth with this die and weighed it on an ordinary grain scale, calculations to obtain the following information can be quickly made for cotton, woolen, worsted or linen:

Average number of yarn; woolen runs or cut; worsted, cotton or linen number.
Number of each kind of yarn.
Grains per square yard.
Ounces per running yard.
Ounces per square yard.
Running yards per pound.
Square yards per pound.
Number of yarn when spun.

This method of calculation is invaluable for analyzing fabrics that are to be duplicated or imitated.

The United States appraisers and custom house officers will use a system based on similar data, and these calculations will be in constant use by importers who wish the know what the duty will be on cotton cloths imported, and by domestic cotton manufacturers who wish to ascertain what the duty will be on competing foreign goods similar to goods of their own manufacture. We do not supply the grain scales, but these may be bought of any supply house.

Textile World Record, 144 Congress St., Boston, Mass.

—OR—

Alfred Suter, 200 Fifth Avenue, New York

FACTS AND GOSSIP.

Pennsylvania, Philadelphia. James Henry has conveyed to Thomas Henry & Sons, Inc., the cotton spinning plant at Tioga St. and Trenton Ave., measuring 376 by 151 feet, for a nominal consideration subject to a mortgage of $138,700. They are manufacturers of cotton yarns which they sell direct.

Pennsylvania, Philadelphia. A charter has been granted George W. Lefferts & Company, Inc. They are manufacturers of worsted yarns at 3d and Moore Sts., where they are spinning under the Bradford system on commission with 4,000 spindles.

Pennsylvania, Philadelphia. The Jecson Mfg. Co., a concern which started operations during 1913 for the manufacture of cotton and worsted goods, locating in the Ontario Mills, 2nd above Columbia Ave., has disposed of the equipment and gone out of business.

Pennsylvania, Philadelphia. The Hall Cotton Maturing Company of Philadelphia has been incorporated under the laws of Delaware with capital stock of $5,000,000 by F. R. Hansel, George H. B. Martin, and S. C. Seymour, all of the Corporation Guarantee & Trust Company of this city. The new company has been organized to establish the process of reclaiming cotton, an invention of John B. Hall. It is claimed that immature bolls are placed in a maturing machine and in two hours they are matured.

*Rhode Island, Kenyon. The Eastern Finishing Works, Lawrence, Mass., which recently purchased the Kenyon Mill property, is installing machinery and putting in a 125 h. p. boiler. A new building is also being erected, 25 by 60 feet.

Rhode Island, Mohegan. Ground has been broken for several new houses that are to be erected by the Wanskuck Company for its employes.

Rhode Island, Pawtucket. The old dye house of the Hope Webbing Company has been sold to another dyeing concern and it is reported the plant will be reopened. The Hope Webbing Company has removed its dyeing department to the new building erected during 1913 on Esther Ave.

KAUMAGRAPH PROCESS

Of Trade Mark Stamping For All Textiles

Send for samples and full information

KAUMAGRAPH COMPANY

209 W. 38th Street **New York**

PICKER STICKS, SWEEP STICKS AND PICKER ARMS

• No. 1. HICKORY.

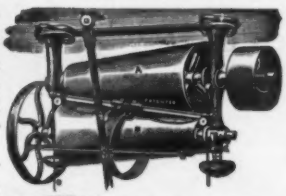
We have been supplying many of the largest Textile Manufacturing Plants with Second Growth **HICKORY PICKER STICKS** for twenty-five years. We are in a position to make you right prices, and to furnish you with just such quantities as you desire. Our Picker Sticks are made of the best hickory possible to obtain, and are thoroughly guaranteed. Sticks are made and fitted exactly as per sketch or sample, which should always be sent with first order.

CHARLES BOND COMP'Y
520 Arch Street, Phila.

Variable Speed Countershafts

The Evans Friction Cone Pulleys will drive your machines at any desired speed from 1 to 6 by simply pulling a cord.

They are guaranteed to do your work.



We'll furnish them for either floor or hanging use.

Over Ten Thousand Sets in Operation in this Country and Europe.

Send for Catalogue.

EVANS FRICTION CONE COMPANY
G. Frank Evans. **Newton Center, Mass.**

Eureka Fire Hose

Cotton Mills, Woolen Mills, Knitting Mills and Factories need positive protection instantly available. Eureka Hose gives protection.

"Eureka" has the lasting quality and the capacity to resist wear and tear.

Fire Hose for every possible duty.

Eureka Fire Hose Mfg. Co.
NEW YORK

Pulley and Gear Forcer.

We build a simple, powerful and very effective machine for removing gears and pulleys from shafting. Many mills use them. **Only costs $8.00.** Saves its cost in time and breakage.

BAMFORD & SMITH, Providence, R. I.

LAMBETH ROPE CORPORATION
NEW BEDFORD, MASS.

Manufacturers of

HIGH GRADE Rim, Scroll, Spindle, Frame, Twister and Cone Winder **BANDING**

Braided Bands and Cords

Lambeth Anti-Fraying Compound

LAMBETH COTTON ROPE FOR POWER TRANSMISSION

New Bedford Textile School

This school is located in New Bedford, Mass., a rapidly growing city and already the largest producer of fine cotton goods in this country.

Instruction given in the theory and art of cotton manufacture in all its branches.

The school has one hundred ten machines for instruction purposes in carding, spinning and weaving departments; seventy in knitting department, the most complete department of the kind in equipment and scope of instruction in this country; twenty-seven machines in machine shop; thoroughly equipped departments in chemistry and dyeing, in designing, and mechanics.

Every instructor a man of broad experience and training.

Fourteenth year. Many graduates filling positions of trust and responsibility. Catalogue sent free on application. Address,

William E. Hatch, Pres., New Bedford, Mass.

Service! Economy! Convenience!

The Autophone System

Gives them. We have

MILL TELEPHONES

For every class of service.

Send for Booklet

S. H. COUCH CO.

174 Purchase Street, Boston, Mass.

This Brush

is the best Mill and Loom Duster at the price on the market

No. 46

Write for Prices and Free Sample

M. Cocker & Co., Phila., Pa.

Use This and Get

5% to 35%

INCREASED EFFICIENCY

From Every Belt Driven Machine in Your Mill

We can prove this. Write for details.

The Warren Co. Mfrs.

Removed from Chicago to: Chicago Road, NILES, Mich.

COMB CIRCLES

and

FALLERS

R. H. Hood Company

Established 1885

1842 Germantown Ave., PHILADELPHIA, PA.

COTTON.

New Mills.

*Alabama, Alexander City. Work has just been started on the construction of the plant for the new Betty Francis Cotton Mills, organized by Benjamin Russell and T. C. Russell, president and treasurer, respectively, of the Russell Mfg. Company, Inc. It is expected the plant will be completed and equipped ready for manufacturing by October 1. The product will be extra carded, double roving, high grade 24/1 underwear yarns, and 5,472 spindles will be the initial equipment. The plant will be constructed and arranged so that this number can be doubled later on if desired. The new concern has capital stock of $100,000. Benjamin Russell is president and buyer and T. C. Russell is treasurer.

*North Carolina, Marion. A charter has been secured by the new Clinchfield Mfg. Company with $500,000 capital stock. The directors are: D. D. Little of Spartanburg, S. C.; Carroll Baldwin of New York; Hugh F. Little, J. L. Morgan, John Yancey, and Byron Conley of Marion. As noted in previous reports the company has contracted for carding, spinning and weaving equipment, including 25,600 ring spindles, 600 automatic looms, but has not ordered other equipment. J. E. Sirrine, of Greenville, S. C., is the architect-engineer. D. D. Little will be president; J. L. Morgan, vice-president; and H. F. Little, assistant treasurer and superintendent.

Rhode Island, Auburn. A. H. Gulliver, who has been working on the organization of a cotton yarn mill for the past year, as noted in previous reports, has organized the Thames River Corp., with authorized capital stock of $100,000. The incorporators are Mr. Gulliver, Wilfred K. Dodworthy and Henry W. Stiness.

*Virginia, Emporia. It is reported the Clinton Mills Company, previously reported incorporated with authorized capital stock of $150,000, has awarded the contract for a $50,000 mill building, also for 5,000 spindles, 100 looms, and electric power machinery. The company has organized with H. A. Ayvad, president; W. Samuel Goodwyn, vice-president and secretary; and E. M. Fadden, treasurer. Mr. Ayvad is president of the Clinton Mills Company of Hoboken, N. J., and also head of the Ayvad Mfg. Company, which makes an article known as water wings used by bathers. Messrs. Goodwyn and Fadden live in Emporia. Several months ago it was known that changes would be made in the Clinton Mills Company of Hoboken, which is an auxiliary of the Ayvad Mfg. Company, and probably the business will be moved to the new plant at Emporia.

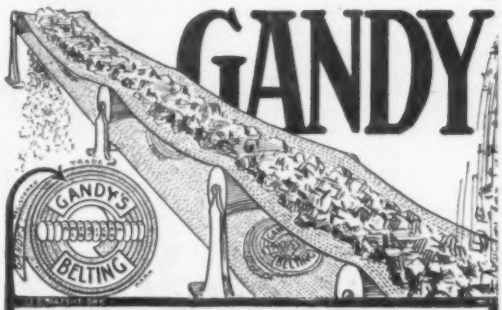
Enlargements and Improvements.

Connecticut, Versailles. Six new cards are being installed in the plant of the Versailles Sanitary Fibre Mills to increase the production. Absorbent cotton and similar goods are manufactured.

*Georgia, Athens. New spindles will not be installed at once by the Southern Mfg. Company, but it is understood that 1,600 new spindles will be installed in No. 2 mill during the year.

For Hard Service

GANDY



COTTON DUCK BELTING

It is in hard service—unusual conditions—that Gandy Belting best proves its durability and worth. One customer writes:

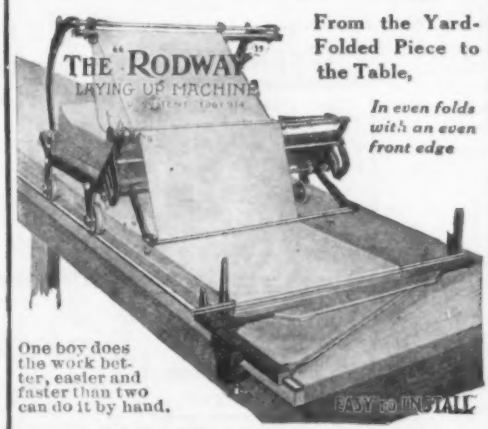
"We have used one of your belts for three years conveying hot sand ranging from 250 degrees to 325 degrees Fahr. and can cheerfully recommend same to anyone for this work."

The Gandy Belt is as successful for conveying purposes as for driving and elevating.

We have records of Gandy Belts used for eighteen and twenty years as main drives that are still in successful use. What Gandy has done for others it will do for you. We will gladly send you full information, samples and name of nearest distributor upon application.

The Gandy Belting Company
747 W. Pratt Street, Baltimore, Md.
New York Office, 36 Warren St.

To Fold to Any Length



From the Yard-Folded Piece to the Table,

In even folds with an even front edge

One boy does the work better, easier and faster than two can do it by hand.

EASY TO INSTALL

GREAT FOR FLANNELS, NAINSOOKS, SHIRTINGS, Etc.

The RODWAY TYPE . . . $150.
The SHUTTLE Automatic . 400.

Write for circulars and users' references

The Shuttle Machine Company
18 East 17th Street, New York

SOMETHING BETTER

THAT'S

Wyandotte Textile Soda

ITS USE SECURES

Better Scouring Effects
Better Washing Effects
Better Bleaching Effects
Better Effects from the Dye

If you are already using Wyandotte Textile Soda you know of these better effects and appreciate that Wyandotte Textile Soda really and truly means "Something Better" to the mill which uses it.

If you are not using it, why not say to yourself, "I cannot afford to pass any article that guarantees me such results, and, too, when these results cost no more than the results I now get."

Order from your supply house or write us for further information.

Also ask about

Wyandotte Concentrated Ash

The J. B. Ford Co., Sole Mfrs., Wyandotte, Mich.

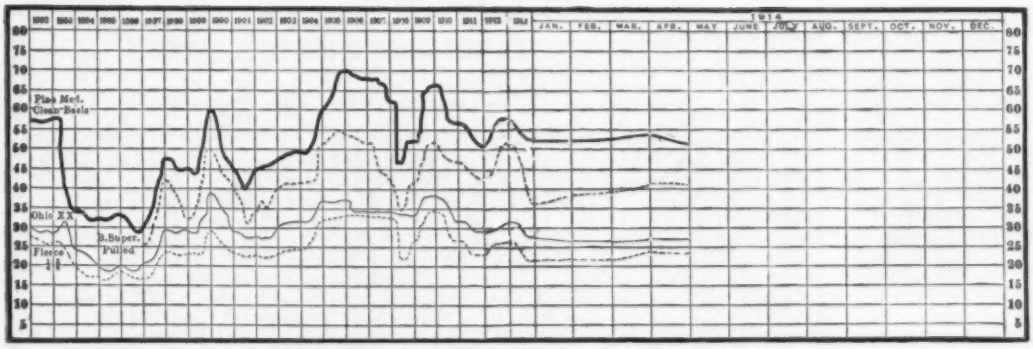


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

THE WOOL MARKET

The steady influx of manufactured goods combined with the political situation and disturbance of foreign relations has increased conservatism among manufacturers and as a result the volume of business in the wool trade has been greatly restricted. It is believed, however, that stocks of wool in the mills are low and that, even with the present restricted demand for goods, spinners will be forced to buy raw material in order to keep the machinery going. Foreign wool markets are firm and prices show no signs of a decline. The goods market is far from satisfactory and many mills have found it difficult to solve the problem presented by the high market for raw material and the slack demand for goods. There has been a small business in foreign wool in the American market, but this branch of the trade has shared the general dullness. Many of the Western wool growers are holding their wools at prices that Eastern dealers have not been willing to meet. As a result the transfer of the clip to Eastern ownership has been delayed.

*Georgia, West Point. Plans have been completed for the $10,000 addition to the cloth room of the Riverdale Cotton Mills, manufacturers of cotton duck.

WOOLEN MILL NEWS

*Rhode Island, Allenton. Col. Joseph E. Fletcher, proprietor of the Allenton Woolen Company, will not move the Allenton Woolen Company and consolidate it with the Coronet Worsted Company at Mapleville, as reported planned. On the other hand it is proposed to increase the capacity of the Allenton Woolen Company by adding 20 more looms and new finishing machinery.

Rhode Island, Woonsocket. An increase of about 25 per cent. is to be made by the Falls Yarn Mills, who recently purchased a 4-story brick manufacturing building from the Woonsocket Rubber Company. Fine woolen and merino yarns are manufactured on present equipment of 4 sets of cards and 2,800 spindles.

Wisconsin, Waupaca. Machinery for the manufacture of men's and boys' hats is to be installed in the plant of the Waupaca Felting Mills.

*Wisconsin, Jefferson. Plans have been made by the Jefferson Woolen Yarn Mill, John E. Owen & Son, proprietors, for building another story on the one-story building used as a picker room. This will make the entire building two stories high and 200 feet long. Recently a new set of cards and a new mule were installed, making the equipment three sets and 1,200 spindles. They will add more knitting machines this year and will make a line of mitten wristlets for the heavy leather mitten trade, also all wool fleeced lining for the trade.

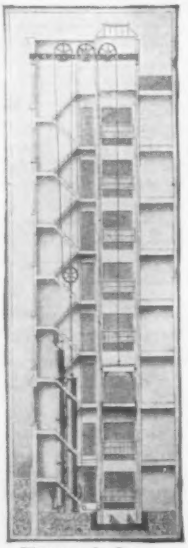
American Dyewood Company

A full line of natural and artificial dyestuffs enables us to handle mill and trade problems from an impartial standpoint. Information and samples cheerfully supplied

New York Boston Philadelphia Hamilton, Ont.

Direct Acting

Double Geared



Elevator in Large Soap Factory in Jersey City

AMERICA'S GREATEST POME

By

"Old Hook-'er-to-the-Biler" Browning.

THE SONG OF THE STEAM HYDRAULIC.

Hydraulic and hook'd
Direct to the biler
She runs at no cost
But the grease used to ile 'er
Yessur!
Fool proof. No repairs
ALWAYS goes, Goodness knows!
If the old biler busts,
Even then UP she goes,
You bet!
When the engin's shut down
And the hands have all gone
She earns all she costs
By working right on.
"Oh, Rats!"
What! "Rats," do you say!
Then listen, you Boob,
YOU DON'T PAY A CENT
UNTIL SHE MAKES GOOD.

(All motion picture and other rights preserved.)

Now you know why it is all manufacturers of fine poetical taste and cultyah, when they need elevators, always

"Hook 'er to the Biler"

CRAIG RIDGWAY & SON CO., Coatesvile, Pa.

ELEVATOR MAKERS TO FOLKS WHO KNOW

The WHITIN RING
WHITINSVILLE MASS. U.S.A.
THE BEST THAT EXPERIENCE CAN PRODUCE, THAT MONEY CAN BUY
WHITINSVILLE SPINNING RING CO.

WHITINSVILLE SPINNING RING CO.

Whitinsville, Mass.

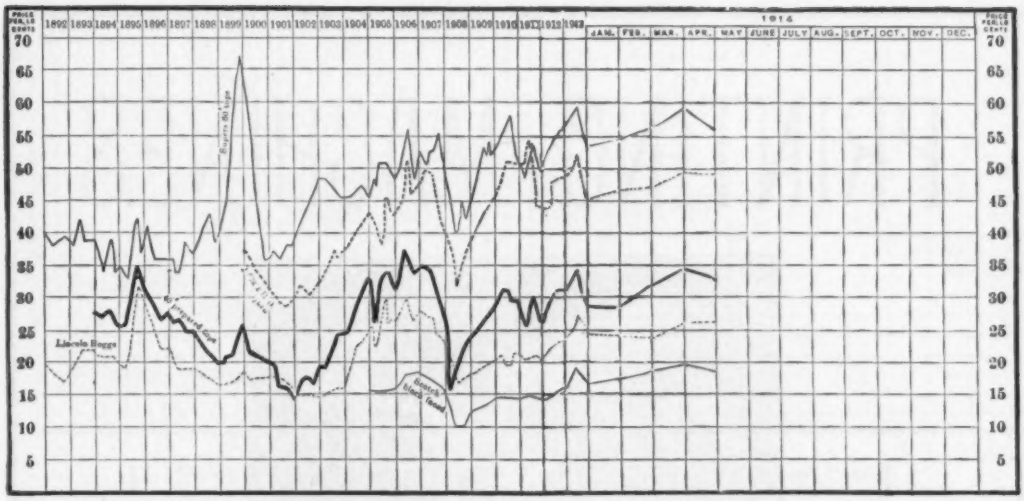


CHART SHOWING COURSE OF PRICES FOR WOOL, TOPS, AND WORSTED YARN AT BRADFORD, ENGLAND

THE BRADFORD MARKET

By Our Regular Correspondent

Bradford, Eng., Apr. 25, 1914.

The carded woolen business has improved appreciably and the mills are going back to overtime and night work. The worsted business remains in an unprofitable and unsatisfactory condition, manufacturers are having to pay more for wool than they can afford, with prospects of having to pay still more for merino. The position of crossbreds has eased somewhat in view of the large arrivals of New Zealand wool. Tops are not quite as marketable as wool and yarn is bad to sell in any quantity.

A few of the best botany spinners are booked well forward, but the remainder are only working from hand to mouth. Crossbred spinners are receiving only such orders as cover the immediate sales of their domestic customers. Since the speculative rally of a month ago they have had very little new business on Continental account.

There are many anxieties as to the course prices will take in London at the series of sales opening April 28. As the colonial sales are all over there is nothing to distract attention from that event. A rise in merino will not be welcome to Bradford and maintenance of existing prices for coarse crossbred would protract local troubles. In the English wool trade there is great curiosity as to the intentions of American buyers and the American attitude will doubtless have a decisive influence upon the price to be paid for the clip in June. The English lambing season has been favorable enough, but it is not expected that the supply of wool will be uncommonly large.

COTTON MILL NEWS

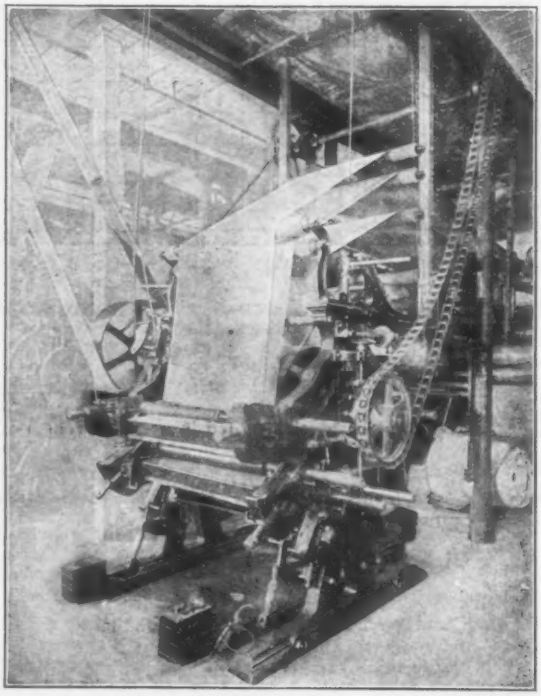
*Georgia, Columbus. It is expected the addition to the Swift Spinning Mills, for which contract has just been awarded, will be completed and equipped ready for operation about August 1. As noted in previous reports, 13,000 spindles are to be added, doubling the production. In connection with this increase the capital stock will be increased from $180,000 to $300,000.

Georgia, Habersham. A water power is to be developed by the Habersham Mills and the plant will be changed over to electric power. It is expected that about 400 h. p. will be developed. J. I. Linler, Walhalla, S. C., is the engineer.

Massachusetts, Millbury. A 3-story addition is to be built to the Cordis Mill which will be 290 feet long and 82 feet wide. It will more than double the output of the plant. The addition will be built on the east end of mill No. 2. The plans for this building are now being prepared, also for a 2-story extension from the new building in connection with the cotton storehouse and picker room, which will eliminate the unnecessary handling of the cotton. Construction work will be started about May 1. It is proposed to add 9,000 ring spindles and 245 looms with necessary preparatory machinery. The present equipment is 7,488 ring spindles and 205 looms. Ticking is manufactured and sold through Bliss, Fabyan & Company. Charles W. Praray, of New Bedford, is the architect and engineer. The electric group drive will be used. The company employs at present about 110 hands and with the new mill in operation approximately double that number will be given employment and the Board of Trade has been asked to take action on the matter of providing houses for the increased population which will result. Fred W. Moore is agent and buyer of the Cordis Mills.

PRINTING MACHINES

1837



1914

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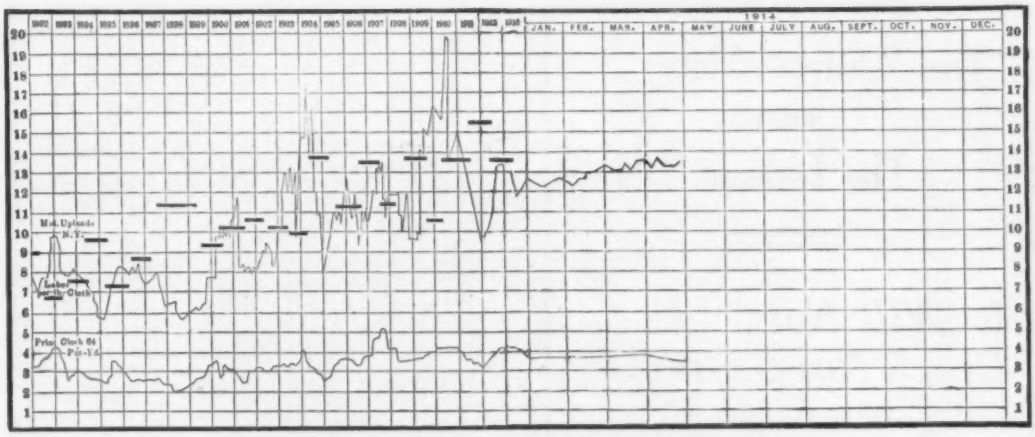

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The short, heavy, horizontal lines indicate the size of the cotton crops in millions of bales.

THE COTTON MARKET

Speculation has been more of a factor in the cotton market during the past month than for some time past. The trouble with Mexico has been a bullish factor which resulted in a partial recovery from the decline. Trade in cotton goods has continued unchanged, and those working for higher prices profess to believe that the consumption of American cotton this year will be far in excess of the supply. Reports from the South are that the new crop is several weeks late. The trade has become hardened to this prediction which is as regular as the seasons. The movement into sight from Sept. 1 to April 24 is reported by the "Chronicle" for a series of years as follows:

Year	Bales
1913-14, April 24	13,177,487
1912-13, April 25	12,395,768
1911-12, April 26	14,342,880
1910-11, April 28	10,914,477
1909-10, April 29	9,523,682
1908-09, April 30	12,309,299

The world's visible supply of cotton on April 24 is estimated by the same authority at 5,411,232 bales, as compared with 4,817,408 bales on the corresponding date in 1913, 5,152,971 bales in 1912, and 3,727,544 bales in 1911.

COTTON MILL NEWS

South Carolina, Central. Three hundred and fourteen new looms are being installed in the Isaqueena Mill, replacing 400 narrow looms that are being removed.

South Carolina, Edgefield. Two new spinning frames have been added to the equipment of the Beaver Dam plant of the Hampton Cotton Mills Company, giving total equipment of 11,552 spindles, and 288 plain looms, making print cloth and sheetings.

*South Carolina, Union. Equipment has been installed and is running in the new 4-story mill erected in the past few months for the Monarch Cotton Mills. The new machinery includes 20,000 ring spindles and 500 automatic looms for making print cloths.

Wisconsin, Chippewa Falls. A large new storehouse is being erected by the Chippewa Falls Woolen Mill.

Mills Starting Up.

Georgia, Hawkinsville. The Hawkinsville Cotton Mill Company, recently organized, has started up the mill formerly operated by the Southern Cotton Mills. The plant was originally known as the Hawkinsville Cotton Mill. Sheets and yarns are being manufactured. C. P. Gentry is president.

North Carolina, Lexington. The new Erlanger Cotton Mills Company has begun manufacturing, but it will be several weeks before all the equipment is in operation.

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COTTON MILL NEWS

*North Carolina, Burlington. In addition to discontinuing the weaving department the old spinning equipment of the King Cotton Mills Corp. is to be discarded. The plant will be recquipped with 9,180 ring spindles with preparatory machinery and electric power equipment to manufacture carded hosiery yarns, 16/1, 18/1, 20/1. The main office is at 921 Mutual Bldg., Richmond, Va. They desire to sell the old machinery and the steam plant.

North Carolina, Burlington. Three hundred h. p. of electric motors have been installed in the Aurora Cotton Mills, Lawrence S. Holt & Sons, proprietors, supplementing the present steam plant of 800 h. p. The finishing and dyeing departments, also a portion of the spinning rom, are now operated by electric power In addition to this improvement they have installed new spinning and carding machinery at the Aurora Mills and also at the Gem Mills, Gibsonville, N. C., amounting to 1,150 spindles at the Aurora Mills and 1,888 spindles at the Gem Mills. The former plant manufactures the Aurora fancy dress ginghams, and the latter plant is producing single and ply yarn, 20s and 26s.

*North Carolina, Concord. The work of repairing and rebuilding the Roberta Mill has been completed and the plant now has 1,500 spindles for making 14s to 26s hosiery and hard yarns. P. M. Keller is manager and buyer.

*North Carolina, Forest City. Changes in the equipment of the Florence Mills, manufacturers of napped goods, chambrays and osnaburgs, consist of replacing 200 old looms with 162 new automatic looms. No other improvements will be made at this time. Charles E. Sampson is president; S. B. Tanner, treasurer, and J. T. McGregor, superintendent. The treasurer and superintendent attend to the buying.

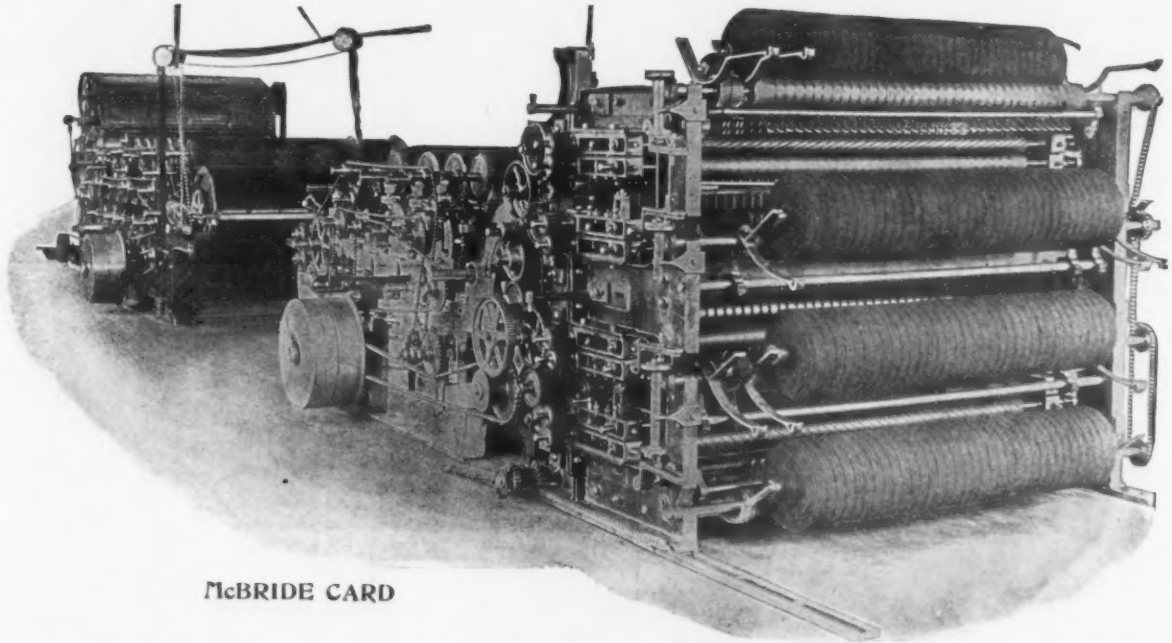
North Carolina, Roxboro. It is reported additional equipment including 5,000 spindles for manufacturing waste yarns is to be installed by the Longhurst Cotton Mill.

*South Carolina, Anderson. An additional expenditure of about $50,000 will be made in addition to the original expenditure of $250,000 in reorganizing and extending the Equinox Mills, formerly the Cox Cotton Mill. The floor space will be increased 10,000 square feet, and new equipment for manufacturing cotton duck will be installed. It is expected the plant will be started up about July 1.

South Carolina, Camden. A second installation of 100 new looms is to be made by the Hermitage Cotton Mills, making 200 new automatic looms that will be employed on fine sheetings. It is reported that the past year was the most successful the mill has ever experienced. Recently the capital stock was increased from $225,000 to $250,000.

Pennsylvania, Philadelphia. Plans have been prepared for a three-story brick warehouse, 40 by 60 feet, to be erected for G. W. Davis, spinner of carpet and rug yarns on Main St., Manayunk.

Only Radical Change in Carding for 50 Years



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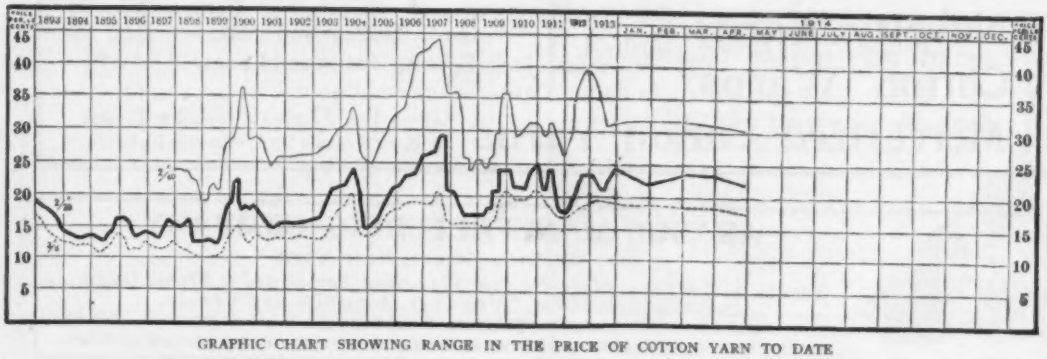

GRAPHIC CHART SHOWING RANGE IN THE PRICE OF COTTON YARN TO DATE

THE COTTON YARN MARKET

The cotton yarn market today is suffering, to a large extent, from the result of some of the previous speculative operations. Early in the fall some of the commission houses booked orders for late delivery at prices which they could not cover at the time with the spinners, planning later to cover at a profit. Contrary to their expectations the market did not weaken, but advanced, forcing them to cover their short sales at the spinner's price with a consequent loss to themselves. At this time apparently they became imbued with the bullish tendency of the market and bought long, some of them placing contracts which extended late into the spring of 1914. The lull in demand has again worked against them and it enlarged some of their accumulations with the result that these houses started to cut prices regardless of the original cost of their yarns or the spinner's quotations. Except in few instances this has increased the manufacturer's conservativeness in purchasing rather than in stimulating buying, and as a consequence Philadelphia prices today are on an average of a full cent a pound less than spinner's quotations and the market very weak. When some of these surplus stocks are reduced we can look for better conditions.

Manufacturers are with few exceptions fairly well employed, a good percentage of them running full, but few if any have much business ahead. This helps to encourage them in continuing their conservative buying.

2/40s warps have been sold the last week in the month at 29 cents, 2/30s at 25 cents; 2/20s at 21 1/2 cents from Philadelphia stocks. When it is considered that the house selling the 2/40s warps at 29 cents is supposed to have paid 31 cents for them, and the house selling 2/20s at 21 1/2 cents paid 24 cents, a good idea of some of the losses being taken is illustrated.

Eastern Cops

6s	19¼
8s	19¼
10s	21¾
14s	22¾
16s	23½
18s	23¾
20s	24¼
22s	24¾
24s	25¼
26s	25¾
30s	26¾
34s	29
36s	30
40s	29½

On cones, ¾c. more up to 14s; 1c. more from 15s to 22s; 1½c. from 23s to 35s, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler

12s	23
14s	23½
18s	24½
20s	25
24s	26½
26s	27½
30s	28½
36s	36
40s	38
45s	42
50s	45
55s	46½
60s	51½

Eastern Two-Ply Warps, Carded Peeler

2/30s	29
2/36s	36

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Cotton Warps — on Beams, Jack Spools, Tubes and Cones. In Fancy Twist, Colors and Printed.

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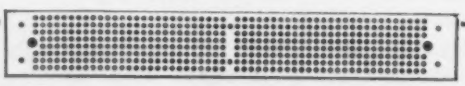

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8s and 9s	20½
10s	20¼-21
12s	21-21½
14s	22
16s	22½
18s	23
20s	23½
22s	24
24s	24½
26s	25
30s	26
40s	33
50s	39

Southern high grade mule yarns:—

Cones

10s	22½
12s	23
14s	23½
16s	24-24½
18s	25
20s and 22s	25½-26
24s	26½

Southern frame yarn, lower grades:—

6s and 8s	19½
10s	20

Eastern cones (high grade quality):—

10s	23½
12s	24
14s	24½
16s	25¼
18s	25¾
20s and 22s	26¼-26¾

Skein yarn (mostly Southern):—

4s and 8s soft	19½
10s and 12s	20-20½
14s and 20s	21-22½
22s	23
10/2	20
16/2	21
20/2	22½
30/2	25½
40/2	31
8/2	20
7/6	20

Southern warps:—

10/1	20
14/1	21
16/1	21½
20/1	22
22/1	22½
26/1	23½
30/1	25½
8/2	21
12/2	21½
14/2	21½

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16/2	22
20/2	22½
26/2	24
30/2	25½
40/2	31
50/2	38

THE LINEN YARN MARKET

Latest advices from Belfast have it that the linen market is exceedingly quiet, with a tendency being noticed within the past few weeks on the part of certain lines of weft yarns to fall in price, but this fluctuation is not noted as being general. On the whole the market is decidedly in favor of the purchaser, while at the same time spinners are making every effort to maintain prices, but it is thought that they will be unable to do so, although they are encouraged in this effort, and are becoming independent, owing to the fact that on certain lines of goods a strong "ring" is in force which is maintaining a high price for the commodities, thus encouraging the spinner of yarns suitable for this trade to hold for high prices. It is thought that in the near future there should be a market entirely in favor of the buyer, as yarns are held in considerable quantities by both the spinners and commission houses.

Yarns for American delivery along certain lines of woven fabrics are scarce and manufacturers are very reluctant to purchase at the prices offered today. Knitting yarns are somewhat easier, but as these yarns are of a selected character and as the flax out of which they are made may be somewhat scarce at present, the price cannot possibly fall as on other lines. On certain numbers we quote this month a fall in price of three cents per pound.

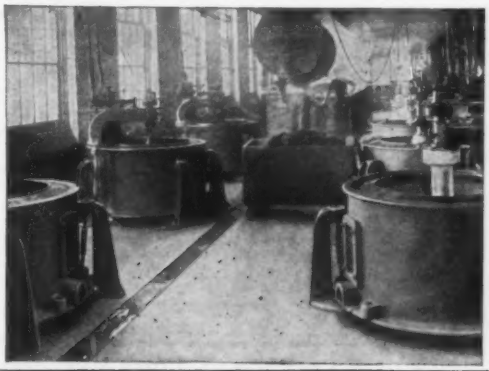
("A" Quality)

35s Lea on cones	83
50s Lea on cones	88
60s Lea on cones	93
80s Lea on cones	98
90s Lea on cones	1.07
100s Lea on cones	1.10
110s Lea on cones	1.25
120s Lea on cones	1.45

WOOLEN.

New Mills.

*Kentucky, Louisville. The Sterling Spinning Company, recently incorporated, will begin manufacturing about May 1 at 1361 South 15th St., making woolen and merino yarns for the sweater and knitting trade on two sets of 60 inch cards and 1224 spindles. The plant will be operated by electric power and will have a raw stock and yarn dyeing department. This concern has capital stock of $25,000. George Dunham, formerly su-



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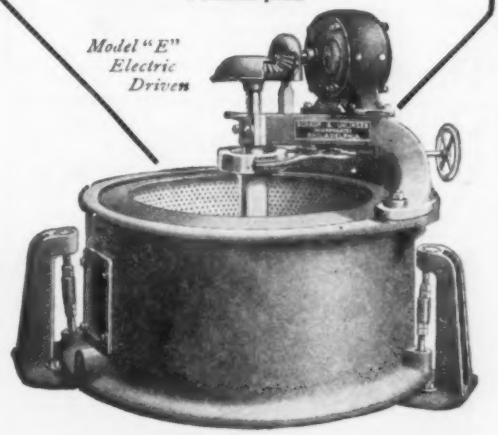

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Special shaped carbon, black diamond, **pointed tools** for turning paper, rag, corn husk and cotton **calender rolls,** hard rubber, fibre, etc. Manufactured by
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WOOLEN MILL NEWS

perintendent of the Falls City Woolen Mills, is president, manager and buyer, and M. W. Brock is treasurer. The product will be sold direct and through the Caron Company, Medinah Bldg., Chicago, Ill.

Massachusetts, Methuen. Frank G. Murch, formerly connected with the Selden Worsted Mill at Lawrence, is starting a weaving plant in Methuen to make fancy worsted goods, and will manufacture under the style of the International Worsted Mills. Twenty-six broad looms will be operated by electric power and employment will be given to about 30 hands. B. Priestley & Co., New York, will sell the product. Mr. Murch attends to the buying.

Enlargements and Improvements.

Canada, Ontario, Arnprior. The Arnprior Felt Co., manufacturers of felts and similar goods in a plant at Galetta, will equip a new mill at Arnprior with three sets of cards, spinning equipment, felt looms and finishing machinery. J. T. Griffith is manager.

Canada, Ontario, Lindsay. Horn Bros., Woolen Company, Ltd., will increase. The town has donated the property formerly used by a brewery which has been turned over to the woolen company. When the enlargement is completed it will give employment to about 300 hands.

*Connecticut, Killingly. Enlargements contemplated by the Assawaga Company, Inc., recently noted, consist of the construction of a new 60 by 50 foot boiler house and the installation of a new boiler.

*Connecticut, Somerville. The addition being built to the dye house of the Somersville Mfg. Company, manufacturers of men's wear woolens, is 60 by 80 feet, and will give more room in the dyeing and finishing departments where they have been crowded for several years. As noted in a previous report, electric power will be installed during the summer if business warrants the expenditure.

Indiana, South Bend. It is reported that bonds to the amount of $200,000 will be issued by the South Bend Woolen Company to improve the plant and increase the production.

*Massachusetts, Clinton. Some new equipment is being installed in the new factory building erected by the Bigelow Carpet Company to take the place of the old wool house.

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THE BIAS NARROW FABRIC CO.
F. C. BARTON, President
65 Worth Street, New York
Bias and Straight Cut Fabrics and Ribbons.
Embossing and Cutting Customers Own Goods a Specialty.

WOOLEN MILL NEWS

Massachusetts, Dalton. Machinery is being installed in a building formerly used as a shoe factory by Sawyer, Regan & Company, manufacturers of fancy woolens for men's wear, and a number of men will be employed there in addition to the regular force at the woolen plant.

Massachusetts, Palmer. The Palmer Carpet Mill of M. J. Whittall will change to electric power, buying electricity from the Central Massachusetts Company. At present a steam power plant is used.

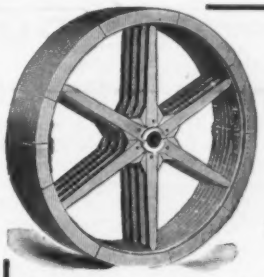
Massachusetts, Rochdale. E. G. Carlton & Sons, manufacturers of white flannels, have awarded the contract for the construction of a new weave shed, 60 by 144 feet. Material is arriving and the addition will be completed in about six weeks. This new weave shed is to be built near the new spinning rooms on the south bank of the river. A decision as to the number of looms to be installed has not yet been reached.

*Massachusetts, Webster. Good progress is being made on the construction of the new $110,000 mill for S. Slater & Sons, Inc. On the completion of the new building a rearrangement will be made of the wool sorting, scouring, drying and yarn departments. The building will be 4 stories and basement, 175 by 132 feet, of brick construction.

New Hampshire, Franklin. A new hydro-extractor has been installed in the finishing department of the Franklin Mills.

*New Jersey, Passaic. Referring to the reports of Forstmann & Huffmann Company's projected enlargements Julius Forstmann states that the enlargement has been exaggerated and the additions under way in Garfield are chiefly for the purpose of concentrating and economizing the work of the weaving and other departments which became somewhat split up owing to the rapid growth of the mills. Mr. Huffmann is quoted as stating that the recent progress of Forstmann & Huffmann Company has been made as a result of the unique position of the company in the manufacture of high grade specialties and novelties, the high quality of which places them above the danger of foreign competition.

New York, Falconer. The property of the Lynndon Worsted Company, until recently operated by James Simpson & Company, has been purchased by the Cleveland Worsted Mills Company. The plant will hereafter be known as the Ferncliff Worsted Mills and will be for the present at least in charge of Fred W. Dixon, superintendent of the Odsonia Worsted Mills department of the Cleveland Company, which is located in Jamestown. The plant will be remodeled where needed to make it more modern. The changes include the installation of an equipment of about 200 looms, making the plant a weaving and spinning plant instead of a spinning plant only as at present, the construction of a tower for needed elevators, and alterations which will provide for toilet and wash rooms, etc.



Gilbert Wood Split Pulleys

SAGINAW Manufacturing Company

Saginaw, Mich., U. S. A.

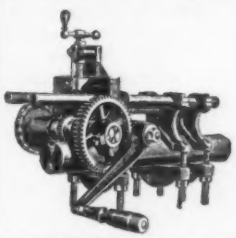
New York Branch, 88 Warren Street
Chicago Branch, 105-109 North Canal Street
Sales Agencies in all the Principal Cities
Cable Address: Engrave A B C and Lieber's Code

DIXON'S FLAKE GRAPHITE

Send for Booklet No. 120. "Valuable Graphite Products"

Made in JERSEY CITY, N. J. by the
JOSEPH DIXON CRUCIBLE COMPANY

YOUR REPAIR SHOP
is not complete unless equipped with one of these
BURR KEYSEATERS



They cut perfect keyseats in shafting anywhere. Save time, delays and money. No. 1 keyseats shafts to 5 in. diameter. Price with full set of cutters, $40.00 net. No. 2 takes shafts to 8 ins. Price, with cutters, $75.00 net.

Interesting booklet free.

John T. Burr & Son
440 Kent Avenue
BROOKLYN, : N. Y.

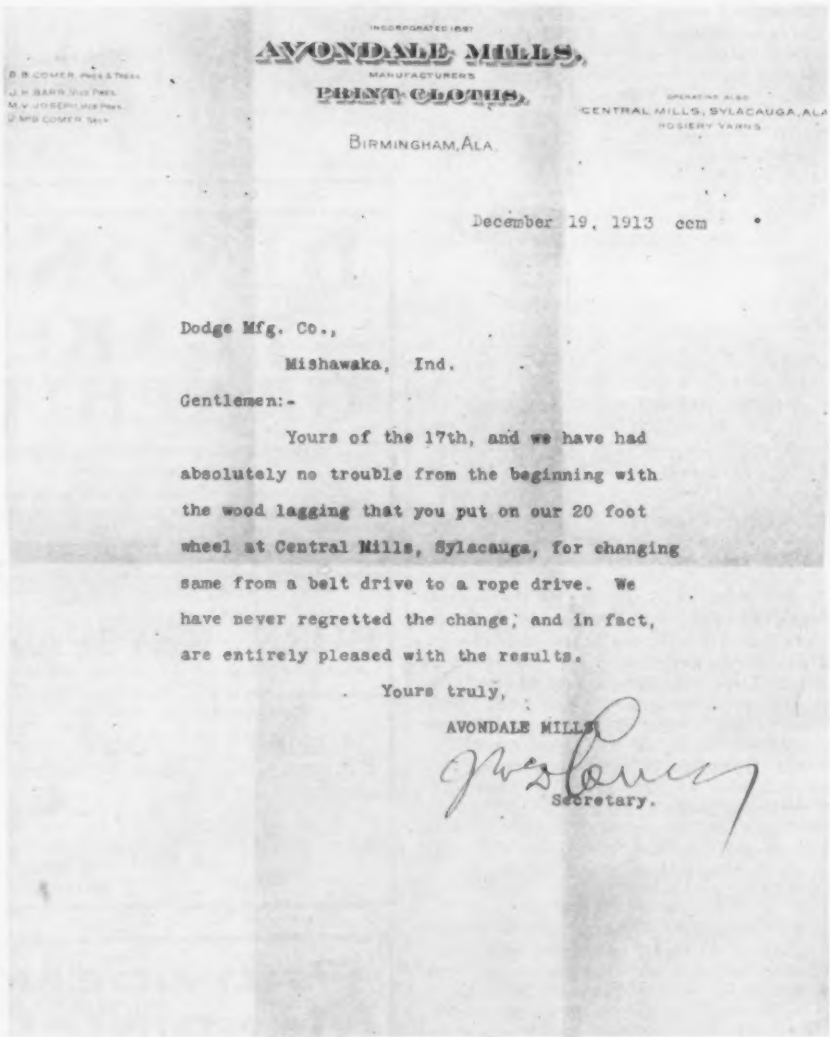
PROVIDENCE MENDING CO.

Burlers, Speckers and Menders of Textile Fabrics

2600 North Sixth St. Bell Phone, Diamond 628
PHILADELPHIA, PA.

DODGE

"Never Regretted Change From Belt to Rope Drive"



INCORPORATED 1897

AVONDALE MILLS,

MANUFACTURERS

PRINT CLOTHS,

OPERATING ALSO CENTRAL MILLS, SYLACAUGA, ALA. HOSIERY YARNS

BIRMINGHAM, ALA.

December 19, 1913 ccm

Dodge Mfg. Co.,

Mishawaka, Ind.

Gentlemen:-

Yours of the 17th, and we have had absolutely no trouble from the beginning with the wood lagging that you put on our 20 foot wheel at Central Mills, Sylacauga, for changing same from a belt drive to a rope drive. We have never regretted the change, and in fact, are entirely pleased with the results.

Yours truly,

AVONDALE MILLS,

Secretary.

Estimates on Complete Transmission Equipments for Textile Mills Cheerfully Furnished Free of Obligation

Dodge Manufacturing Company.

Offices and Works: - MISHAWAKA, INDIANA

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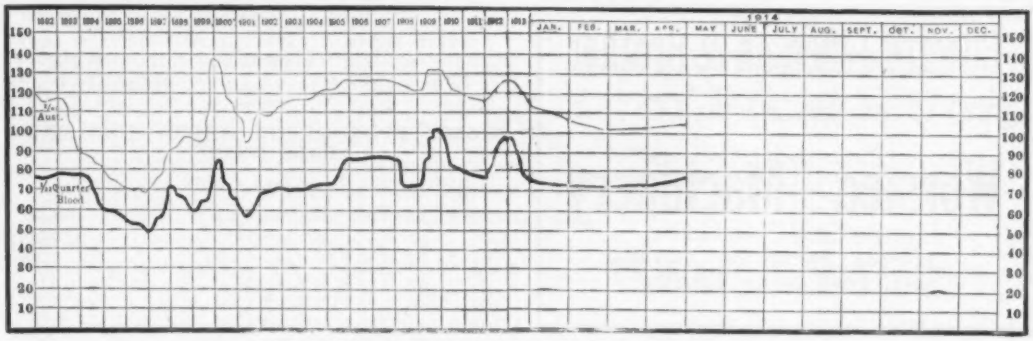
815 Arch St.	129 Purchase St.	128 W. Third St.	28 S. Forsyth St.	237 Second Ave.
CHICAGO	NEW YORK	MINNEAPOLIS	ST. LOUIS	PORTLAND, ORE.
214 So. Clinton St.	21 Murray St.	100 N. Third St.	408 N. Fourth St.	14th and Lovejoy Sts.



GRAPHIC CHART SHOWING RANGE IN PRICE OF WORSTED YARN.

WOOLEN AND WORSTED YARN MARKETS

Spinners of worsted yarns report that during April business has been only fair, some mills being slack and others busy on special lines, such as yarns for men's wear trade in 2/40s, some 2/50s; 1/20s and 1/30s, slub dyed black yarns for single filling. Mixes which have been rather active are not in urgent demand. Prices remain firm owing to the condition of the wool market, which is advancing. There is very little call for yarns from the trade in general and what business is coming in is somewhat spotty and for small lots to meet the requirements of orders on hand from the weaving trade and for prompt shipment

The dress goods business is quiet, the conditions prevailing with them being about the same as in the men's wear lines. What they are using at this time is mostly in Bradford spun worsted, cotton and woolen yarns.

It is not anticipated that prices will advance any more than they have, but it is assured that they will remain firm at present quotations. Spinners, also, however, make the claim that all indications point to a better business beginning with the month of May.

In yarns for the knitting trade the worsted spinners are somewhat busier than the woolen spinner, although business with them is not what it should be at this time of the year. They are running mostly on old contracts with little new business being placed, but feel confident that new orders will be placed on or before June for deliveries for the rest of the season. Many spinners seem to incline to the fact that there will be an active demand for knitting yarns late in the season.

There is, however, some inquiries from the knitters of the higher class of women's sweaters for the better grades of yarns and fancy colors in Copenhagen, delft, tango brown and champagne, in counts ranging from 2/16s to 2/20s in half bloods or so-called zephyr yarns.

BRADFORD SPUN YARN

2/16 Ingrain (black)	54
2/16 Ingrain (light grey)	55
2/16 Ingrain (white)	56
2/12 to 2/16 low common	60-62½
2/20 to 2/24 low 1/4	62½-65
2/20 to 2/25 1/4 blood	67½-70
2/26 to 2/28 1/4 blood	70-72½
2/32 1/4 blood	72½-75
2/20 3/8 blood	75-77½
2/26 3/8 blood	80-82
2/32 3/8 blood	82-84
2/36 3/8 blood	82½-85
2/40 1/2 blood	92½-95
2/40 delaine	95-1.00
2/50 delaine	1.02½-1.05
2/40 Australian	1.02½
2/50 Australian	1.10-1.12½
2/60 Australian	1.17½-1.20
3/30 and 3/32 luster	95-97½
3/36 luster	1.10-1.12½

KNITTING YARNS

Dyed and Bleached—Bradford System

2/7s straight 1/4 blood	75-77½
2 and 3 ply 10s-15s straight 1/4 blood	77½-80
2 and 3 ply 16s-20s straight 1/4 blood	77½-80
2 and 3 ply 20s-24s straight 1/4 blood	80-82½
2 and 3 ply 24s-28s straight 1/4 blood	82½-85

FRENCH SPUN YARN

1/20 1/4 blood	67½
1/20 high 1/4	70
1/20 3/8	75
1/20 high 3/8	76-78
1/20 1/2 blood	81½
1/30 1/2 blood	85
1/40 1/2 blood	87½
1/50 delaine	1.00-1.02½
1/40 Australian	95-97½
1/50 Australian	1.02-1.05
1/60 Australian	1.10

Edward Jefferson & Brother

SPECIALISTS IN

Worsted Machinery

117-123 South 2d Street
PHILADELPHIA, PENNA.

William Whitman Co.
COMMISSION MERCHANTS
COTTON and WORSTED YARNS
BOSTON NEW YORK PHILA. CHICAGO CHARLOTTE

JAMES LEES & SONS CO.
MINERVA MILLS
Spinners of WORSTED YARNS
For Weaving and Knitting
In the Grey and in all colors and mixtures
Philadelphia Office: 627-29 Bourse Bldg.
Mills and Office: Bridgeport, Montgomery Co., Pa.

J. B. Jamieson
77 Summer St., Boston
Imported Worsted Yarns
For Knit Goods, Men's Wear and Dress Goods

HAROLD R. SHIRLEY
242 Chestnut St., Philadelphia, Pa.
French Spun Worsted and Merino Yarns
Bradford Spun Yarns
Woolen Yarns
FOR WEAVING AND KNITTING

Woolen and Merino YARNS
Eaton Rapids Woolen Mills
EATON RAPIDS, MICHIGAN

Simplex Yarn Tables.

Showing equivalent sizes of different systems of numbering yarn; cotton, woolen, worsted, etc., so that the sizes of different standards may be quickly compared. Also contains a number of other valuable yarn tables for designers, manufacturers and knitters. PRICE 50c. Textile World Record, Boston.

1/70 Australian 1.15-1.20
For two ply knitting twist add 5c. additional to above prices.
For two ply weaving yarns add 7 1/2c. additional to above prices.

—÷—

FRENCH SPUN MERINO YARNS—FINE ONE-HALF BLOODS

Standard Grade

1/20 50/50 White Merino Cop	67½
1/30 50/50 White Merino Cop	69½
1/40 50/50 White Merino Cop	72½
1/20 60/40 White Merino Cop	71
1/30 60/40 White Merino Cop	73
1/40 60/40 White Merino Cop	76
1/20 70/30 White Merino Cop	74
1/30 70/30 White Merino Cop	76
1/40 70/30 White Merino Cop	79½
1/20 80/20 White Merino Cop	76½
1/30 80/20 White Merino Cop	78½
1/40 80/20 White Merino Cop	80½
Sliver and Sanitary Mixes	3c. more
Coning on 1/20	2c. more
Coning on 1/30	3c. more
Coning on 1/40	4c. more

WOOLEN AND MERINO YARNS

Spinners report business as being very dull. Some of them have shut down their plants awaiting a revival of the knitting business, while others are running on contracts which were placed with them last fall and in many cases have several months to run yet. There is very little business being placed, although some of the sweater manufacturers are willing to buy when exceptionally good offers are made to them. It is not expected that there will be anything in the way of general buying until June, for the reason that the jobbing trade is slow in placing business and what they are giving out is extremely limited in size, which has compelled the manufacturer to buy from the spinner simply as his needs require. The numbers mostly in demand are 2/20 and 2/23 cut in colors, oxfords and some little double bleaches. Prices remain at about the same level that have prevailed for the past month. It is maintained in many quarters that business will improve when the knitters begin to receive their orders.

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WOOLEN AND MERINO YARNS

2/20 Light Grey Mixed 80%	20%	52-55
2/20 Light Grey Mixed....90%	10%	57½-60
2/20 Light Grey All Wool		62½
2/20 Colored All Wool		60
2/20 Bleached 80%	20%	62½-65
2/20 Bleached 90%	10%	67½-70
2/20 Bleached All Wool		70-72½
2/23 Colored All Wool		62½-65
2/23 Bleached 90/10		67½-70
2/23 Bleached All Wool		72½-75
2/25 Light Grey Mixed All Wool		80-82½
2/25 Bleached All Wool		85-87½

THE RAG AND SHODDY MARKET

The market for rags and shoddy is unchanged. Orders have been placed to meet immediate requirements of the spinners, but trade has been quiet and there is no disposition to increase stocks. This situation corresponds with that prevailing in the wool trade. The wool waste market has been very dull, sales having been small in number and in the quantity of material that has exchanged hands. Prices, however, have been firm. A small business has been done in cotton waste with prices somewhat lower. Some grades of wool rags show an advance in price, this being true for the better grade of material. There is a good demand from abroad for American rags. We quote as follows:

SHODDIES AND EXTRACTS

White yarn, best all wool	46-49
White knit, all wool, best fine	30-40
White, knit, No. 2	23-30
Light yarn, extra fine	35-36
New pure indigo blue	24-27

Merino

Fine light, all wool	**20-22**
Medium light, all wool	**19**
Fine black, all wool	**17-19**
Fine dark, all wool, best grade	**18-20**
Medium dark, all wool, No. 2	13-15
Red knit stock, strictly all wool	**20-24**
Red flannel, all wool	**19-22**
Dark blue for hosiery, strictly all wool, No. 1	20½-22
Dark blue for hosiery, not all wool, No. 2	13-15½

NEW WOOLEN RAGS

Fine merchant tailors	6-8
Choice light colors	7-8½
Browns	12
Blacks	6
Blues	9½
Fine dark	7½-12
Medium dark	4-5

Serges

Black	9½
Blue	10-11

Flannels

Very light	17-18
Mixed	10-11
Black	6-7

SOFTS AND KNIT STOCK

Soft woolens, best	5-6
Old white flannels	11-14
Old red flannels	10-11
Old blue flannels	3-5
Old plaids	3
White stockings	20-24
Clear dark hoods	7-8
Light hood stock	13-14

Interruption of Production

is recognized by textile mill operators as the most costly element of repairs.

Allis-Chalmers TEXTILE MOTORS

are so liberally designed and so sturdily constructed that they will operate for years without need of repairs providing they are properly supplied with oil while in service.

"Motors for all drives"

Allis-Chalmers Manufacturing Company

Power and Electrical Equipments

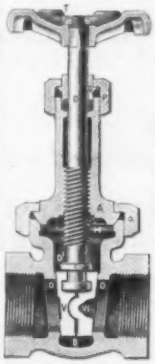
Milwaukee - Wisconsin

For all Canadian business refer to Canadian Allis-Chalmers, Limited, Toronto, Ont.

POWELL VALVES

(Especially The White Star Valve)

FIVE POINTS OF EFFICIENCY COMBINED IN THE POWELL WHITE STAR GATE VALVES



1. Body symmetrically designed and well proportioned.
2. Metal distributed to meet the most wear.
3. Union bevel ground joint connection.
4. Note double-disc. Not a wedge disc but two discs with ball and socket back. Smooth working and self-adjusting.
5. All parts made to gauge and are interchangeable.

Ask your Dealer for POWELL Valves, or write us

THE WM POWELL CO.

DEPENDABLE ENGINEERING SPECIALTIES

CINCINNATI, O.

CHENEY SILK YARNS

For Every Purpose

It is a well-known fact among manufacturers of silks and silk-mixture goods that Cheney Silk Yarns meet the highest demands for quality and uniformity.

Our unusual manufacturing facilities (the Cheney Yarn Mill being the largest of its kind in the United States) enable us to fill promptly all orders for all standard silk yarns, both spun and reeled, organzines and trams, doubles and singles.

A specialty is made of supplying silk yarns to individual orders for every manufacturing purpose.

Samples and quotations on request.

Cheney Silks are of superior quality, and include practically every kind of goods made of silk—whether for dresses, millinery, decoration or upholstery, the haberdasher or manufacturer, man or woman.

CHENEY BROTHERS
Silk Manufacturers
4th Avenue and 18th Street, New York

National Silk Dyeing Co.

Main Office, PATERSON, NEW JERSEY, 140 Market Street

NEW YORK SALESROOM, 60 UNIVERSITY PLACE

Skein Silk Dyeing of every description for every class of textile manufacture.

Hosiery Dye—Boil-off, weighting and dyeing, treated especially to meet the requirements of the hosiery and knitting trade.

Piece Dyeing and Finishing—All silk and silk mixed goods.

Printing—Surface and warp printing.

WORKS:

Paterson, N. J. Dundee Lake, N. J. Allentown, Pa. Williamsport, Pa.

THE SILK MARKET

While very few changes in prices of raw silk can be noted, the market seems to be in a rather unsettled condition. This in part is probably owing to the trouble we are now undergoing in Mexico, and partly to the fact that no one can at this time safely estimate the amount of the raw product that will be used.

It is quite possible that the market would have shown an advance at this time if it were not for the uncertainty which now seems to prevail. As a result buying will likely follow. In Japan the market is reported steady, with but little buying. This condition exists in both Shanghai and Yokohoma. Very little of the old crop of raw silk is on hand at the present time, but it is expected that the new crop which will be ready in June will be a much larger one than last year.

Canton reports also a steady market, with little activity, but the outlook for a good crop later seems very bright, which will no doubt advance prices to a certain extent. In Milan the silk market is reported a little firmer, but no great activity is shown, although the manufacturers are fairly busy, and the outlook for fall is promising.

At Lyons and in fact through all of the silk districts in that country, business is reported very much improved, with a bright future ahead.

The manufacturers in this country are not buying much of the raw product. This is owing to the uncertain business outlook and also the unsettled style situation existing at this time. No one is able to predict just what style of the finished product will be in demand.

The broad silk manufacturers are not very busy, this time being between seasons, but are optimistic as to the fall trade, and expect a good demand for their product.

Ribbons are still in great demand, and the manufacturers in this line are very busy. It is stated that ribbons will probably be popular for some time to come. Silks and silk mixed goods are having a good call, and the outlook for a good fall business never was better. Crepe de chine, messalines, crepe-moires in black are very popular. Taffetas also look good for fall, while Roman stripes for trimmings, linings and sashes, are being much used. It looks now as though bright satins would be very popular for fall wear, and manufacturers in this line are preparing for the expected demand.

The cotton manufacturers are still buying much raw silk, although in smaller quantities at the present time. The knitting manufacturers are using but little silk, but as the season advances it is thought that they will again be buying their usual quota.

All signs point to a good fall season in the silk industry unless the political policy of watching and waiting should infuse a like spirit into the business world, which is not at all likely. Below are prices current:

VILLA, STEARNS COMPANY
Telephone, 6174 Gramercy
American Woolen Building
221 Fourth Avenue, New York
RAW AND THROWN SILK
Silk on Spools, Cones, Quills, Beams
DYED SILK FOR ALL PURPOSES
Philadelphia Office:
538-40 N. Third St.
Providence Office:
Howard Building

KROUT & FITE MANUFACTURING CO.,
MANUFACTURERS OF
Silk, Cotton and Mercerized Narrow Fabrics
SPOOL TAPES A SPECIALTY
TELEPHONE CONNECTION
OFFICE AND MILL ALLEGHENY AVE. AND EMERALD ST., PHILADELPHIA

Spun Silk Yarns

For All Purposes

SILK NOILS

Champlain Silk Mills

500 Driggs Avenue

Brooklyn, N. Y.

OFFICES:
New York, 38 East 25th St.
Prov., R. I., Industrial Trust Bldg.

MILLS:
Brooklyn, N. Y.
Whitehall, N. Y.

SAUQUOIT SILK MFG. CO.

INSULATING AND BRAIDING SILKS

ORGANZINE, TRAM AND HOSIERY SILKS

Fast Dye Organzines for Woolen Manufacturers a Specialty

Mills: Bethlehem, Pa., Philadelphia, Pa., Scranton, Pa. New York Representative, Wm. Ryle & Co., 225 Fourth Ave.
Philadelphia Office, 4015 Clarissa St., Nicetown
Chicago Office, 206 So. Market St. Boston Office, 78 Chauncey St.

SILK CITY WARPING CO.

No. 167 Ward Street, Paterson, N. J.
ADDRESS ALL CORRESPONDENCE TO NEW YORK OFFICE,
CARE E. GERLI & CO., 119 E. 27th STREET
All Frames Equipped with Latest Improvements, Particularly W. & R. Oscillating Reed Motion,
The Latter Assuring Complete Relief to Strain on Silk
GOODS FULLY INSURED BY FIRE. PROMPT SERVICE GUARANTEED.
Raw Silk Warping a Specialty.

WILLIAM RYLE & CO.,

FOREIGN AND DOMESTIC

SPUN SILK YARNS and NOILS

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

225 Fourth Ave., Corner 18th St., NEW YORK CITY

European

Grand Extra Classical Piedmont 12/14	5.05-5.10
Extra Classical Italian 12/14 12/16	4.70-4.75
Classical Italian 13/15 24/26	4.45-4.50
Best No. 1 Italian 13/15 24/26	4.45-4.47½

60 days' basis

Japan

Filature Kansai Extra Extra	4.47½-4.50
Filature Kansai Extra 13/15	4.25-4.27½
Filature Shinshu Extra 13/15	4.20-4.25
Filature Kansai Best No. 1 13/15	4.10-4.15
Filature Kansai No. 1 13/15	4.05-4.07½
Filature Shinshu 13/15	4.00-4.02½
Rereels No. 1 13/16	Nominal
Rereels No. 1½ 13/16	Nominal
Rereels No. 1½-2	Nominal

6 months' basis

China

Canton XXA 14/16 (New Silk)	3.45-3.55
Canton .B 14/16	3.40-3.45
Tsatlee Blue Dragon Flying Horse	3.25-3.30
Tsatlee Kun Kee Mars No. 1	2.80-2.85
Tussah Filature 8 Cocoon No. 1-2	1.45-1.50

6 months' basis

SPUN SILK

Manufacturers of spun silk are still very busy, and orders for that product are booked far ahead. From all accounts the demand will probably be good for some time to come. No change in prices, which are quoted below:

60/2	3.70
50/2	3.60
40/2	3.50
30/2	3.35
20/2	3.25
10/2	3.15

ARTIFICIAL SILK

Business in artificial silk is fairly good, but manufacturers are optimistic as to future, and expect a good fall business. It is predicted that much artificial silk will be used the coming season, in the many lines of the textile trade. Prices remain the same:

150 Deniers First Quality European	1.95
150 Deniers Second Quality European	1.85
150 Deniers English A.,—Bleached	1.95
150 Deniers English B.,—Bleached	1.85
150 Deniers English C.,—Bleached	1.70
150 Deniers Elberfeld Raw	1.75
150 Deniers Chardonette Natural	1.85

A. P. Villa & Bros.

Raw, Thrown and Dyed Silks

Silk on Quills or Beams. Hosiery Silk on Cones

Societa per la Filatura dei Cascami di Seta, Milan (Italy)
Cascami Silk Spinning Company of America

"Cascami"

Schappe, Spun Silk, Cordonnets for Sewing in Skeins—on Cops—Spools —Cones—Beams.
In Gray or Dyed.
Special attention to regularity of sizes.

A. P. Villa & Bros.

Sole Agents for the United States and Canada

Emmett Building, 95 Madison Avenue, New York

Tel. 10080 Madison Square **Mills: Passaic, N. J.**

SPUN SILK

YARNS FOR ALL PURPOSES

AMERICAN SILK SPINNING CO., PROVIDENCE, R.I.

MINDLIN & ROSENMAN

Importers and Manufacturers of

RAW and THROWN SILK, ARTIFICIAL SILK

Mercerized and Cotton Yarns, Yarns and Threads

131 Mercer Street, New York

Our Specialty:
DYED SILK FOR THE KNITTING TRADE
on cones and tubes

Factory and Dyehouse, **Brooklyn, N. Y.**

CONSULTING SILK SPECIALIST
JAMES CHITTICK
122 EAST 25th STREET, - NEW YORK
Costs Calculated, Advice Given on Mill Matters, Damaged Goods, and on Textile Questions of every kind
Mill Properties Reported On
Also Author and Publisher of the Book
"Silk Manufacturing and Its Problems"
580 pages 9x6, price $2.80 delivered
Deals with all phases of Manufacturing, Distributing, Financing, etc. Prospectus sent on request.

LUDWIG LITTAUER
YARNS
Tram, THROWN SILK, Organzine.
ARTIFICIAL OR WOOD SILK.
Plain, Gassed, Mercerized, Prepared and other Cotton Yarns. Polished and Glazed Threads and Yarns. Mohair and Worsted, Tinsel and Turkey Red Yarns.
Best Quality Harness Twine
109 GREENE STREET, NEW YORK
Silk Throwing Mills BOONVILLE and YONKERS, N. Y.
YARNS

SILK MILL SUPPLIES
OF EVERY KIND AND DESCRIPTION
Also Power Transmission Supplies for General Mill Use
I. A. HALL & CO.
Paterson, N. J.
Allentown Reed, Harness and Mill Supply Co.
Allentown, Pa.

Alexander Smith & Son
Warping and Winding on Commission
Work Done on Frames with Swiss Motion
All Goods Fully Insured
Raw Silk Warping a Specialty
Cor. Front and Ferry Streets EASTON, PA.

United States Conditioning & Testing Company
Cotton, Wool and Silk Conditioning
Fabric Testing and Chemical Analyses
Offices and Laboratories, 340-44 Hudson St., (cor. Charlton St.)
NEW YORK
D. E. Douty, Mgr. F. G. Boye, Supt. K. B. Lamb, Chem. Eng.

Silk Throwing and Waste Silk Spinning — *Rayner*
Deals with the preparation of yarn from the raw silk; also waste silk spinning and the utilization of waste products. For silk manufacturers or workers, or for men who use silk in connection with cotton, worsted or wool. 158 pages; 117 illustrations; cloth. Price, $2.50 Prepaid.
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SILK.

New Mills.

Massachusetts, Lawrence. Henry Bauer is installing 12 silk looms on the third floor of the Wilson Block, 616 Essex St., and will manufacture novelty silks, fancy vestings, and trimmings, from silk and mercerized cotton. Mr. Bauer has been employed in the Washington Mill, and the Arlington Mills of Lawrence, and in various silk novelty plants.

*New Jersey, Bloomsbury. Contract for the construction of the projected new silk mill has been awarded to J. A. Nagle, contractor, of Allentown, Pa., and ground has been broken. The building will cost $19,000. The new company was organized by John H. Meyer & Co., 50 Union Sq., New York, manufacturers and converters of cotton and silk goods, and $12,000 was subscribed by the citizens of Bloomsbury toward the project.

New Jersey, Paterson. S. Newman has started a silk commission warping and winding business at 11 1/2 Fair St., and states he has good enough prospects to warrant making an increase in his equipment. Another floor in the same building will be taken May 1.

New Jersey, West New York. Another New York concern will locate its factory in West New York. Work has been started on a factory building for the Williams Silk Mfg. Company, manufacturers of silk linings, etc., on 145 looms at 304 E. 23rd St., New York City. The new plant is located at Palisade Ave., near 10th St. It is understood the new plant will represent an investment of about $60,000.

*New York, Bolivar. Chiffons and veilings will be manufactured by the new Bolivar Silk Company, Inc., on equipment of 20 looms. It is expected manufacturing will be started about July 1. Officers have not been elected as yet but J. P. Challand, formerly manager of the Andover (N. Y.) Silk Company, will be manager, superintendent and buyer. Gas power will be used. A charter was recently granted the new company with authorized capital stock of $20,000.

*Pennsylvania, Avoca. Two-thirds of the stock of the proposed new silk company has been subscribed. It is reported a site has been secured and that construction of the building will be started at once. John F. McLaughlin, J. H. Anderson, H. N. Weller and David Dick will apply for a charter for the company.

Pennsylvania, Lebanon. A factory building at 12th and Walnut Sts. has been secured for the new silk mill which it was recently noted would be started by Alex. Brueen of Catasauqua, and alterations are being made preparatory to the installation of looms. A charter has been secured for the new company under the name of the Cumberland Silk Company with capital stock of $15,000.

Pennsylvania, Lopez. Work on the new silk mill for the Mason Silk Mills of Paterson, N. J., and Dushore, Pa., is being rushed with the expectation of having the building finished by June 1. It will be 250 by 54 feet, one story high, and will hold 150 broad silk looms.

SILK MILL NEWS

Pennsylvania, Chester. Confirming a report previously given in the Advance News the Chester Silk Company, Inc., which was chartered early in March under the laws of Delaware with capital stock of $250,000, is the same project as the new artificial silk plant of Murphy & Bro., Philadelphia, which has been established in Chester in a mill owned by Murphy & Bro. The equipment of the plant is now being installed. Artificial silk will be made by the cupro-ammonium process. Associated with Murphy & Bro. is H. Bernstein, a manufacturer of millinery trimmings at 1017 Race St., Philadelphia. Mr. Bernstein has had considerable experience in projects for the manufacture of artificial silk, having been connected with a plant located at one time at the S. W. corner of 5th and Columbia Aves, Philadelphia, which was subsequently removed to Norristown and known as the Art Fibre Company. This enterprise was later discontinued and there were some prospects of establishing it at Camden, N. J.

Pennsylvania, Reading. Charles Steiner, who has been superintendent and manager for Stunzi Sons Silk Company, Inc., ever since that concern purchased the Steiner & Talcott silk plant, has rented a mill at Reed and Elm Sts., and is installing 50 broad silk looms. It is expected that 25 additional looms will be installed soon after operations are started. Mr. Steiner's successor with Stunzi Sons has not been chosen as yet.

Enlargements and Improvements.

*Massachusetts, New Bedford. Alterations are being made in the plant of the Gilt Edge Silk Mills on Kempton St. with a view, it is said, to installing more looms. The company state that they are not going to add any looms just at present. Broad silks are manufactured.

New Jersey, Paterson. Janowitz Bros., manufacturers of broad silks, are moving from 130 Broadway to the Ward Street Mills. A slight increase will be made.

New Jersey, Paterson. Machinery is being installed in the new mill recently built by the Goldie Ribbon Company. The top floor has been let to a tenant, while the three remaining floors are reserved by the silk company.

New Jersey, Paterson. An addition is being built to the mill of B. Edmund David which will be devoted entirely to offices and lunch and dressing rooms for employes.

*New York, Binghamton. Details of the projected enlargement to be made by the Ballard Silk Company have not been completed. It has been reported that the capacity would be increased from 32 looms to 75 or 100 looms. Silks are woven on commission.

New York, Binghamton. Plans have been prepared for an addition to the plant of the Chenango Silk Company, manufacturers of silk linings and silk dress goods. It is reported that the enlargement will cost about $20,000 and will increase the office and shipping departments in addition to providing more manufacturing space. 200 broad looms are operated at present.

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That's where
Graves Garnetted Stock
puts the
DOLLARS
for you.
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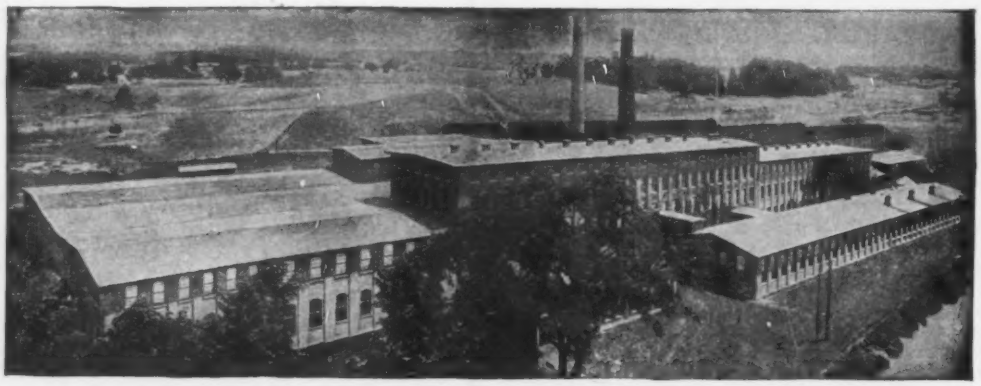
Made of Cotton, Wool
and Silk.

Frank B. Graves Co.
34 Arch Street, Albany, N.Y.

The Vulcan Roving Can prevents broken ends

in roving by its smooth, glossy inside finish and true running on the card table. The body is made of the best chemically treated fiber which has many of the qualities of rawhide. All rivets are burred so they cannot draw out. Rings are made of steel and have rounded edges. Every can is accurate in size and perfectly round. They are built for long continued satisfactory service. Write for prices and list of users.

James Hill Manufacturing Co.,
PROVIDENCE, R. I.



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Everything in White Goods.
Capacity, 30 Tons Daily

JOHN MacMANUS, Manager — CHADWICKS, N. Y.

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Does not stain white silk threads in goods.
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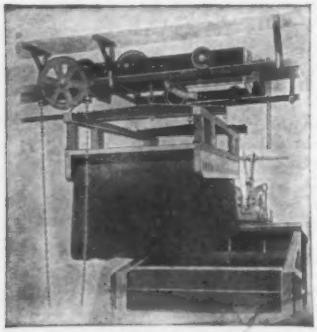

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Constructed throughout of wood, except the propeller and shaft. No other metal parts exposed to the liquor. Necessary bolts securely encased in wood.

Our Construction Impossible With Other Types

No Stuffing Boxes. No Hinged Gates. No Springs or other metal parts. Efficiency Tested and Superiority Acknowledged.

Operated with least possible labor. Can be loaded or unloaded in less than 10 minutes

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Elbridge G. Snow, President

Organized 1853 MAIN OFFICES, 56 CEDAR ST.

Cash Capital, $6,000,000

ASSETS, January 1, 1914	$33,139,915.81
LIABILITIES (Except Capital)	17,066,896.12
SURPLUS AS REGARDS POLICY HOLDERS	17,873,019.69
Losses Paid Since Organization over	145,000,000.00

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For Loss of
Profits
Commissions
Use and
Occupancy
on acceptable
Protected Plants
at the
Minimum Rate

IS prepared to entertain liberal lines on Sprinkler-Equipped and Modern Improved risks generally, having a special department for the consideration of such business.

OWNERS OR TENANTS may have for the asking proper advices in relation to the FIRE HAZARD and the Value of Automatic Sprinkler and other protection for the manufacturing or distributing plant. Correspondence invited by the

DEPARTMENT OF IMPROVED RISKS
56 CEDAR STREET, N. Y.

DYESTUFFS AND CHEMICALS

Acetic, 100 lbs.	2.16-2.56
Citric, domestic	38½
Copperas	65-80
Oxalic	7½-8½
Sulphuric, 66°, 100 lbs.	1.00-1.25
Muriatic, 18°	1.15-1.65
Tartaric crystals	30-33
Miscellaneous Chemicals and Dyestuffs	
Acetate of lime, gray, 100 lbs.	2.50-2.60
Alum, lump	1.75-1.90
ground	1.85-2.00
powdered	3.00-3.15
Aqua ammonia, 26°	2-5½
Borax	3-5
Cream tartar, crystals	23-25
Fuller's earth, powdered, ton	17-20
Glauber's salt	75-85
Potash, chlorate, crystals	8-9
powdered	9-14½
carbonate	3½-6
Soda, bicarbonate	1.15-1.50
Soda, caustic, domestic, 60 per cent.	1.80-1.91
Sal., American	65-85
Vitriol, blue	4.76-5.00
Acetate of soda	4-6½
Acid, picric, best crystals	70-75
tannic, commercial	36-37
Albumen, egg	42-65
blood	20½
Aniline, oil	9
salt crystals	8½-9½
Alizarine	15-16
Bichromate of potash, American	7-8½
Bichromate of soda	4-7
Bisulphite of soda	75-1.25
Cutch, bales	5-8
Dextrine, imported potato	4-7
Divi-divi, ton	33-47

MILL NEWS

*Massachusetts, Framingham. The Seamans & Cobb Thread Mills, formerly of Sharon, are established in their new quarters in the Long shoe factory, and have resumed manufacturing.

*Massachusetts, Lowell. Construction work is going forward on the new boiler house of the Lowell Bleachery. This will be 100 by 60 feet, 1 story high, with a capacity of 1,000 h. p. of boilers. The old power plant is to be retained for possible emergencies. John A. Stevens is the engineer in charge. The construction of a new storehouse for the Lowell Bleachery is in prospect but it is not definite that this construction will be taken up this year.

New Jersey, Paterson. A large addition to the present plant of the Oriental Silk Printing Company has been completed. The new building is 1 story high, 40 by 100 feet, of brick construction, and will be equipped for dyeing and printing silk and silk mixed goods.

*New Jersey, Paterson. The new Gaede Silk Dyeing Company, organized by Robert Gaede, formerly of the National Silk Dyeing Company, and his sons, will begin operations in two or three months. They will employ about 200 hands. Skein silk dyeing will be done. Property at 4th Ave. and River St. has been secured and building operations are now going on. The new company has capital stock of $250,000. Robert Gaede is president, and William R. Gaede, treasurer.

The WM. H. LORIMER'S SONS CO.,

MERCERIZERS AND DYERS

Manufacturers of

MERCERIZED YARNS

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Skeins, Cones, Tubes and Warps

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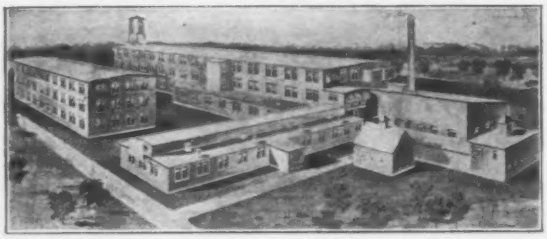
PETER B. MCMANUS, Pres. and Treas. EDWARD J. MCCAUGHEY, Secy. and Mgr. JOHN MCMANUS, Vice-Pres

HOME BLEACH AND DYE WORKS, Inc.



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COTTON YARNS

IN SKEIN, AND LONG AND SHORT

CHAIN WARPS

FAST COLORS A SPECIALTY

Daily Capacity 30 Tons

FAST COLORS AND BLACK FOR WORSTED TRADE

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FOR ALL TEXTILE PURPOSES

Fast Colors on Silk for Worsted Manufacturers

Pure Dye and Weighted. Bright and Souple.

Dyers of Peerless Black on Artificial Silk.

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DYERS of all kinds of YARNS

For Manufacturers of: Men's Wear, Dress Goods, Carpets, Rugs, Upholstery, Hammocks, Shoe Goring, Webbing, Gas and Electric Tubing, Braids and Novelties. Better work, prompter, better service than you get elsewhere.

T. BROPHY'S SONS, Jasper St., above Clearfield St., Established 1845 PHILADELPHIA, PA.

SILK MILL NEWS

New York, Binghamton. It is reported that another floor of the building occupied by the Rossville Silk Mills Company is to be equipped for manufacturing purposes.

New York, Gloversville. A new mill is being erected on Washington St. for the Normandie Silk Mills, Inc., a new concern which began the manufacture of silk cloth for gloves, underwear and similar goods, in a mill on Cayadutta St. several months ago.

*New York, Gloversville. Construction contract has been awarded to H. R. Bradt for the large addition to be built to the plant of the Fulton County Silk Mills, Inc. It is expected the building will be completed in July. The structure will be 3 stories high and will have a ground measurement of 98 by 56 feet. It will be of brick and concrete, equipped with a modern sprinkler system and careful attention will be paid to ventilation and the convenience of employes. As noted in a previous report the new equipment to be installed includes 10 winders of 80 spindles each, and 10 broad looms for making silk glove cloth. Another story is to be built on the 2-story brick mill erected a year ago and this addition will be connected with the new building.

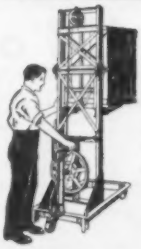
*New York, Port Jervis. The projected new mill of Kattermann & Mitchell Company will be erected during the summer. At a special meeting of the Board of Trade held recently it was stated that the full amount required for the purchase of the lot to be donated to Kattermann & Mitchell Company as a site for the new mill has been subscribed and plans for building operations will proceed at once so as to have the mill completed and ready for occupancy during the summer. As noted in previous reports a mill is to be erected at a cost of about $35,000 and the machinery now operated in Paterson is to be moved to Port Jervis. At present a branch mill is operated here and this consolidation of the larger plant with the smaller branch is due to the unsettled labor conditions prevailing in Paterson. The mill will be 2 stories high, 200 by 50 feet, according to earlier reports.

Pennsylvania, Allentown. The Winona Silk Company will break ground at once for an addition to their plant at Mountainville. Twenty more broad silk looms will be installed as soon as the building is finished.

Pennsylvania, Bally. George W. Melcher, proprietor of the Orino Silk Mills, is building an additional story on the northern wing of the plant and will add some new equipment. Silk ribbons are manufactured on 28 looms.

Pennsylvania, Berwick. The Muster Company, silk throwsters, are installing more machinery. The night force employed by this company has been increased.

*Pennsylvania, Egypt. Foundations have been put in for the 50 by 100 foot addition to the plant of the Feldhege Silk Mfg. Company. The enlargement will be 2 stories high and will be equipped with 100 new looms for weaving broad silks.



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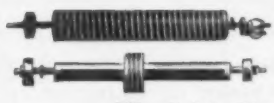
Textile Machinery
Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.
Special Machinery Built. General Machinery Repairs.
Relagging Picker Cylinders a Specialty.

EMPIRE MILL CRAYONS
"BEST BY TEST"
THE AMERICAN CRAYON CO.
Waltham, Mass. and Sandusky, Ohio



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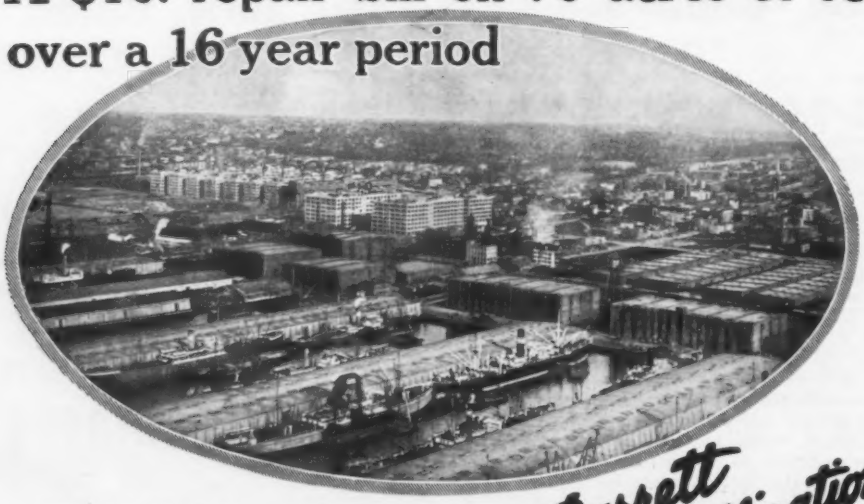

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Every inch of this is roofed with Barrett materials—and, since 1897, when the first roof was covered, the cost of maintenance has been *less than $10.00.*

The Bush Terminal people write us:

"We use this kind of roofing because our experience has shown it to be the best and cheapest. Our analysis of first cost of application and cost of maintenance entitles us to speak with some measure of authority."

The idea behind the Barrett Specification is an old one, established by years of experience—namely, that coal tar pitch, tarred felt, and gravel or slag, when properly laid, make the best and most economical roof.

Barrett Specification Roofs

Architects, engineers and contractors know that if the Barrett Specification is followed absolutely, the resulting roof will last longer and cost less than any other kind.

Special Note—We advise incorporating in plans the full wording of the Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested:

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B

MILL STOCKS

FALL RIVER MILLS

	Bid.	Asked.	Last Sale.
American Linen Co.	...	70	...
Ancona Co., com.	...	...	...
Arkwright Mills	...	65	...
Barnard Mfg. Co.	...	60	...
Bourne Mills	...	110	...
Border City Mfg. Co.	...	101	...
Barnaby Mfg. Co.	...	...	...
Chace Mills	100	...	...
Charlton Mills	83	...	...
Cornell Mills	...	...	...
Conanicut Mills	...	95	...
Corr Mfg. Co. (Taunton)	...	...	...
Davol Mills	...	90	90
Davis Mill	...	...	...
Flint Mills	100	101	...
Granite Mills	...	...	...
Hargraves Mills	...	50	...
King Philip Mill	...	...	107½
Laurel Lake Mills	...	115	...
Lincoln Mfg. Co.	...	85	...
Luther Mfg. Co.	...	126	...
Merchants Mfg. Co.	...	85	83
Mechanics Mills	...	90	...
Narragansett Mills	...	105	...
Osborn Mills	100	103	...
Parker Mills	...	...	...
Pilgrim Mills, pfd.	...	90	...
Pocasset Mfg. Co.	...	102	...
R. Borden Mfg. Co.	120	...	...
Sagamore Mfg. Co.	170	...	...
Seaconnet Mills	...	55	...
Shove Mills	...	77½	...
Stafford Mills	75	80	...
Stevens Mfg. Co.	...	...	...
Tecumseh Mills	...	105	...
Troy C. & W. Manf'y	...	...	...
Union Cotton Mfg. Co.	173	...	...
Wampanoag Mills	...	85	...
Weetamoe Mills	...	87½	...

NEW BEDFORD MILLS

	Bid.	Asked.
Acushnet Mill	137½	...
Beacon Mfg. Co.	102½	...
Beacon Mfg. Co., pfd.	114	115
Booth Mfg. Co.	...	21
Booth Mfg. Co., pfd.	47½	52½
Bristol Mfg. Co.	...	70
Butler Mills	...	90
Butler Mills, pfd.	...	100
City Mfg. Co.	90	...
Dartmouth Mfg. Co.	...	140
Dartmouth Mfg. Co.	100	...
Gosnold Mills, pfd.	...	93
Grinnell Mfg. Co.	...	180
Hathaway Mfg. Co.	...	...
Holmes Mfg. Co.	100	...
Holmes Mfg. Co., pfd.	102	...
Kilburn Mill	110	...
Manomet Mills	114	116
Nashawena Mills	64	68
Nield Mfg. Co.	92	...
N. B. Cotton Mills Co.	100	...
N. B. Cotton Mills Co., pfd.	...	98
Nonquitt Spinning Co.	...	94
Page Mills	...	76
Pierce Mfg. Co.	300	...
Pierce Bros., Ltd.	100	...
Potomska Mills	...	123
Quissett Mills	...	98½
Quissett Mills, pfd.	99½	...
Sharp Mfg. Co.	...	85
Sharp Mfg. Co., pfd.	...	*100
Soule Mills	75	80
Taber Mills	...	100
Wamsutta Mills	118	...
Whitman Mills	120	...

*Ex-dividend.

OTHER NEW ENGLAND MILLS

	Latest Sale.	Previous Sale.
Aetna	‡100	...
Am. Woolen, pfd.	75⅛	76
Amoskeag	65	65
Amoskeag, pfd.	99	100
Androscoggin	135¼	140
Appleton	172	171
Arlington	80	80
Bates	220	220
Bigelow Carpet	167⅞	157
Boott Mills	98	98
Boston Mfg. Co.	*105¼	105¼
Boston Duck	1240	1325
Brookside Mills	113⅛	110
Cabot Mfg. Co.	120	120
Chicopee	90	95
Columbian	‡1012½	...
Continental	75¼	75
Draper	230	230
Dwight	1021¼	1020
Edwards	‡99	98½
Esmond, pfd.	90	97
Everett	110	117½
Franklin	205	206
Great Falls	180	178
Hamilton Woolen	95	97
Hamilton Cotton	83	81
Hill	90¼	115
Jackson	890	985
Lancaster	92	85
Lawrence	151¾	151½
Lockwood	97	97
Lowell Bleachery	125	125
Lowell Hosiery	40	...
Lyman	120	120¾
Massachusetts	116	115½
Mass. Mills in Ga.	93¾	93
Merrimack, pfd.	85	85
Merrimack, com.	30⅛	25
Middlesex	58½	60½
Monadnock Mills	‡1000	...
Nashua	665	650
Naumkeag	172½	180
N. E. Cot. Yn., com.	24	26
N. E. Cot. Yn., pfd.	67	66
Newmarket	95	90⅛
Otis	‡1352½	...
Pacific	112½	112
Pepperell	290¾	290
Pemberton	99	95
Plymouth Cordage	228	230⅛

THE

"No-Waste"

Seamless Hard Fibre Roving Can

It does not have the riveted seam that strains and breaks the sliver

NO SEAMS OR RIVETS

ABSOLUTELY SMOOTH

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Fibre and Steel Clad Cars
Doffing Trucks
and
Mill Boxes All Kinds

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Tremont & Suffolk	103	99
Winthrop	100	100¼
Waltham B. & D.	*129	132
York Mfg. Co.	85	86¼

*Ex-dividend.

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Brown Mfg.	118	...
Brown Mfg., pfd.	...	100
Cannon	150	...
Chadwick-Hoskins, pfd.	...	101
Cliffside	190	200
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Drayton	...	60
Erwin	...	155
Erwin, pfd.	...	105
Florence	...	135
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Gibson	109	...
Gray	...	130
Greenwood	49	...
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Highland Pk.	186	200
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Imperial	...	...
Kesler	150	165
Lancaster	130	...
Lancaster, pfd.	95	100
Loray, pfd.	...	86
Marlboro	52½	...
Pacolet	100	102½
Parker, guar.	...	98½
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Patterson	129	...
Vance Mill	70	...
U.-Buffalo, 1st pfd.	40	...
Ware Shol's	...	70
Washington Mills, pfd.	100	...
Williamston	...	100
Williamston, pfd.	...	90
Wiscasset	140	...
Woodlawn	120	130
Woodside, pfd.	...	80
Woodruff	...	107

*Tennessee, Knoxville. Another story is to be built on the Holston Underwear Mill by the Appalachian Mills who recently took over the property. It was noted in February the Holston Mill is to be equipped, after alterations, with 8,000 spindles for making 8s to 14s cotton yarns for men's underwear made by the Appalachian Mills. To provide for this increase the capital stock of the Appalachian Mills was increased from $100,000 to $200,000.

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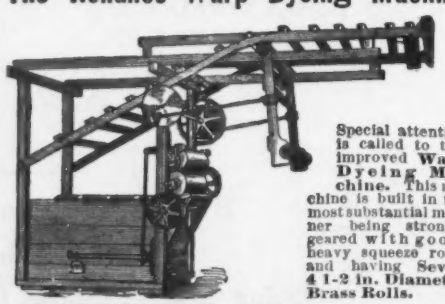

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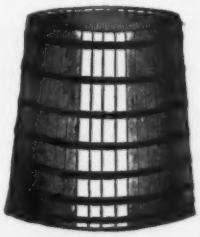

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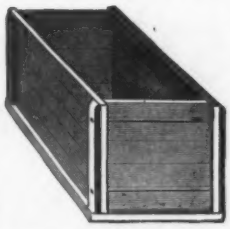

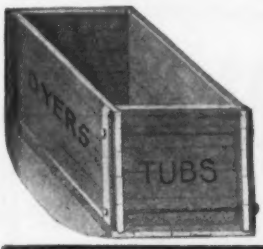

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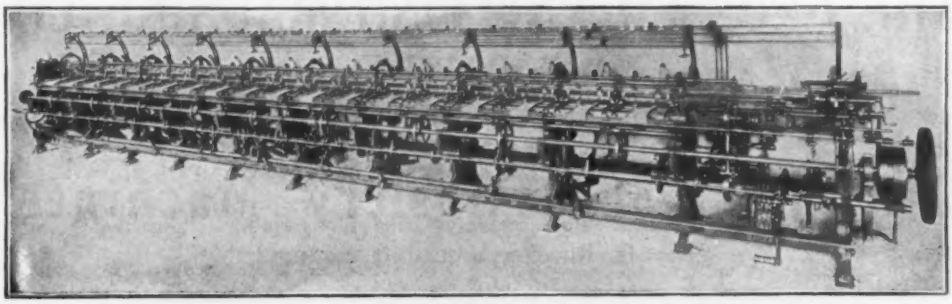

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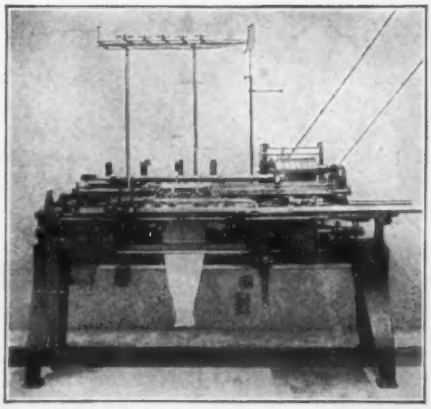

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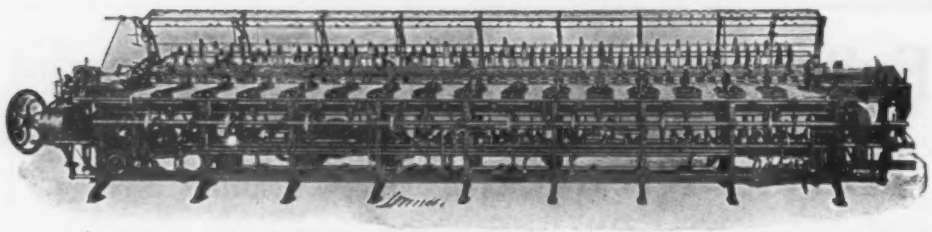

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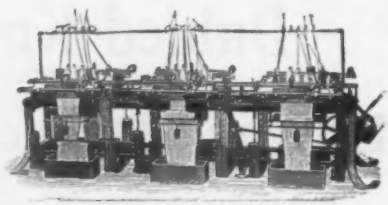

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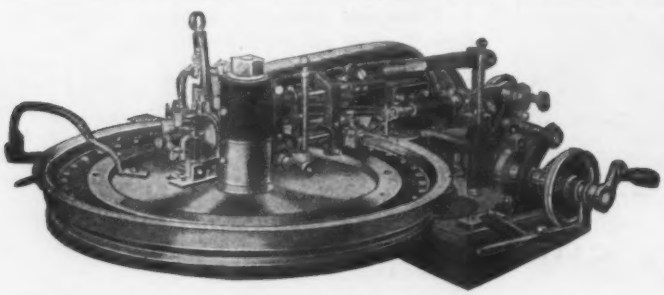

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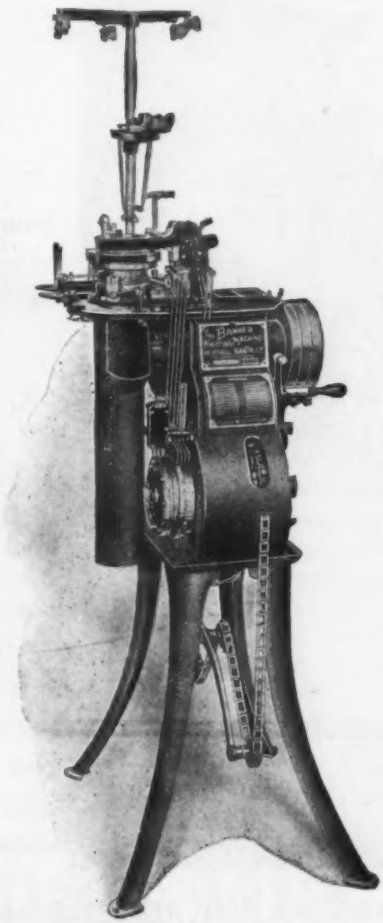

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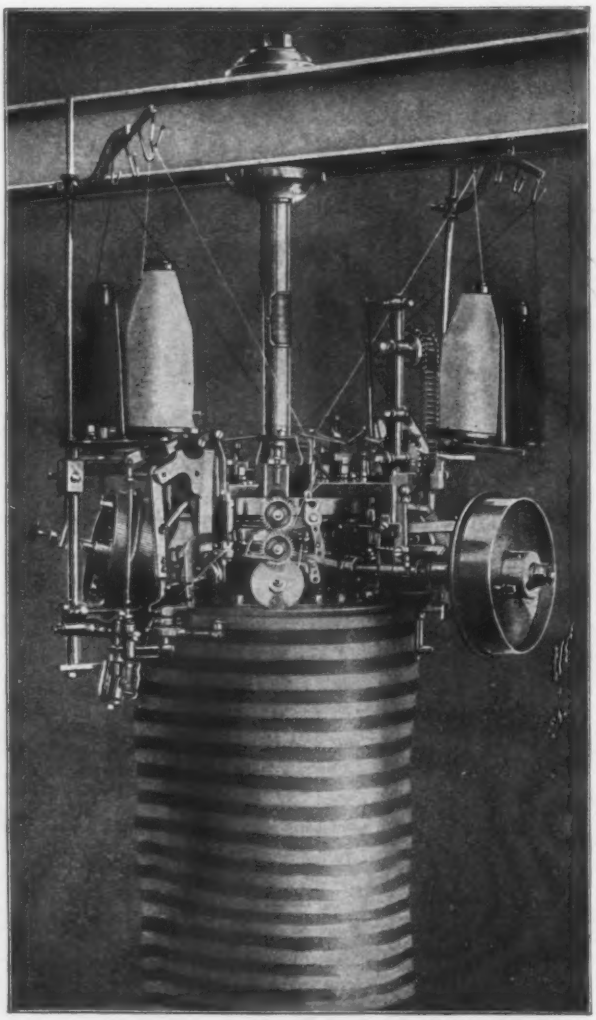

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For Flat Work Only

This type of machine is the best for fancy work such as Striping, Tucks, Lace, Collarettes, etc. But on plain work it also has the following advantages over all other types:

It makes perfect web on every grade of yarn and will take *without preparation* from the lowest shoddy to the wiriest pulp yarns.

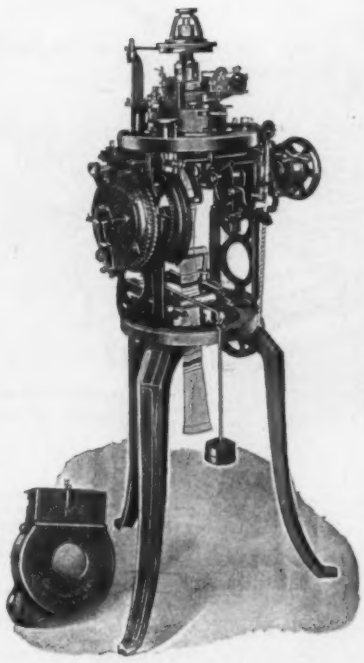
THESE FRAMES DO NOT REQUIRE SKILLED HELP

Full particulars, samples and catalogues from our New York representative:

Howard Sillcocks, 1310 Downing Bldg., 106 Fulton St., N. Y. City

A Still Newer Necktie Machine

For Diagonal Patterns



AMONG our other new features are a body machine with revolving cams, instead of revolving cylinder and dial.

This machine is equipped with the dogless attachment, thus eliminating the many troubles due to the use of dogs with which all other American rib machines have to contend.

In addition there is a new friction drive which facilitates starting the machine from either front or back.

Also an improved yarn guide and latch guard.

Wildman Mfg. Co.

Established 1889

Norristown, Pa.

MFG. Trade Mark

Full Fashioned Hosiery Machines

BUILT BY

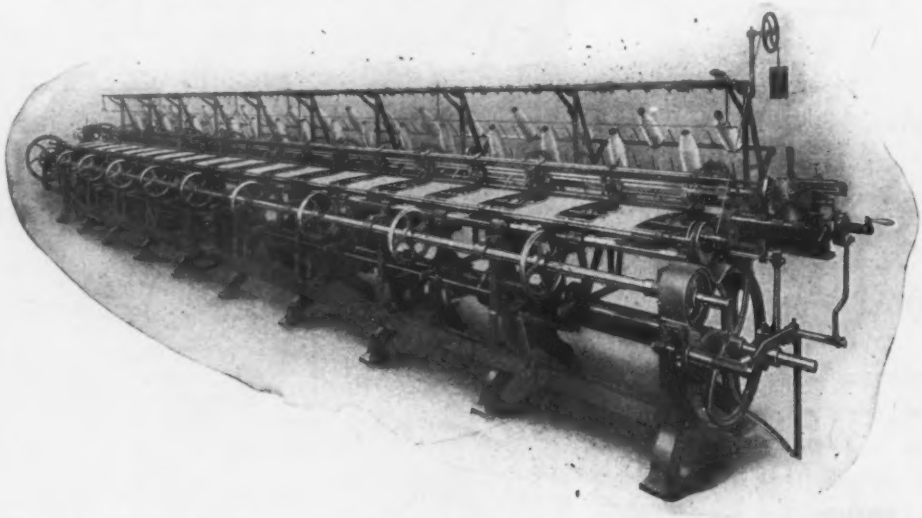
Schubert & Salzer Maschinenfabrik

and their two Branch Works

H. ALBAN LUDWIG and THEODOR LIEBERKNECHT

Chemnitz, Germany

Largest Manufacturers of all Classes of Hosiery Machines



Schubert & Salzer, in addition to the plant of H. Alban Ludwig, have recently acquired the plant of Theodor Lieberknecht and continue to build Full Fashioned Hosiery Machines in each of the three plants, retaining the special features of each individual type and at the same time using on all three machines various patented devices and all the practical attachments known to the trade. These machines are built in all gauges from 14 to 34 needles to the inch and from 12 to 24 sections.

Best Constructed, Most Economical and Productive Machines on the Market

REFERENCES:

All the leading manufacturers of full-fashioned hosiery in this country.

American Representative:

OTTO WALTHER, 507 Bourse, Philadelphia

A New "Union Special"

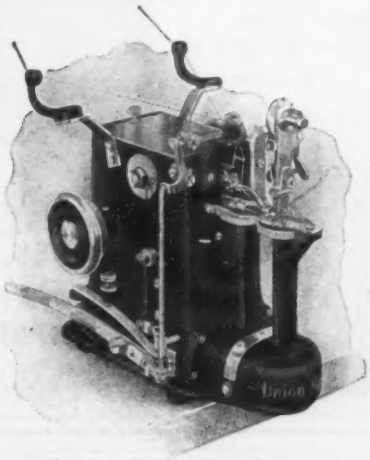
Cup Feed Machine for Seaming Selvage Edge Hosiery

Quiet, Light Running, High Speed

Double Thread Interlock Seam
perfectly flat and non-irritating

Ends of Seams Locked
giving looper finish

Finest Gauge Silk Fabric
To heaviest cotton hose seamed with equal facility



Improved Adjustable Uncurling Device
insuring perfect seam

Both Feeding Cups Actuated
insuring positive feed upon both selvages, avoiding puckered seam

Quickly Adjustable Stitch Regulator
without interchanging parts.

Union Special Machine Company

HOME OFFICE AND FACTORY
300 W. Kinzie St., Chicago, Ill.

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Drying Forms

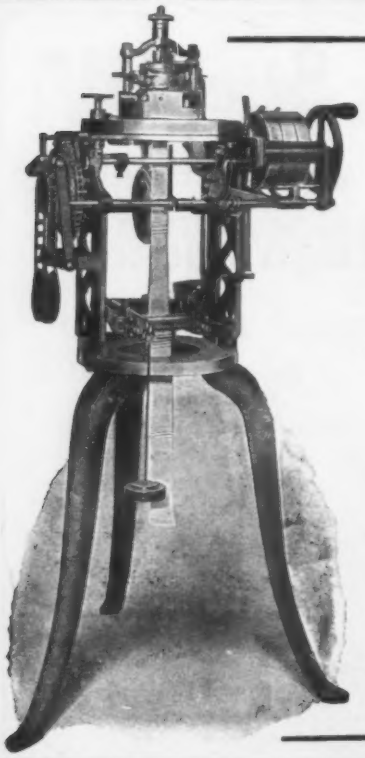
BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

JOS. T. PEARSON 1815-21 TAYLOR ST. KENSINGTON PHILA.

Hosiery Boards



H. BRINTON COMPANY

213-217 Race Street, Philadelphia, Pa.

BUILDERS OF

Circular Knitting Machinery

of every kind for every purpose

HOSIERY RIBBERS

with Splicing, Striping, Two-speed, Selvage Welt and French Welt Attachments.

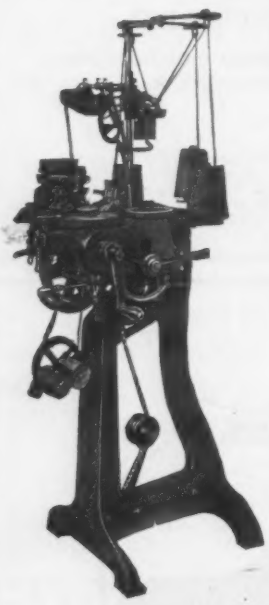
Full Automatic Hosiery Footers

BODY MACHINES, SLEEVERS, etc.

for Underwear, Sweaters, Toques, etc.

NECKTIE MACHINES

for making all kinds of tubular knitted scarfs.
Write for catalog, prices and samples.



THE INVINCIBLE

Full Automatic Knitter

"The Knitter That Knits"

All The Time

SEAMLESS HOSIERY
OF
QUALITY

JENCKES KNITTING MACHINE CO.
Pawtucket, R. I.

Philadelphia Show Rooms, 1211-1217 Filbert Street

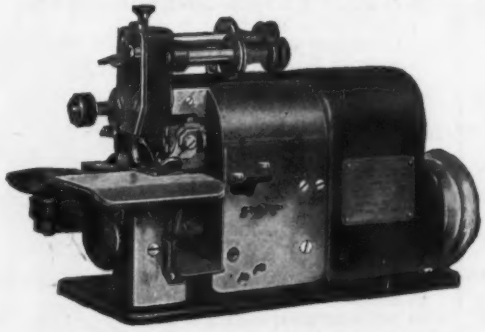
The Merrow

FAST

DURABLE

Light Running

High Speed Overseaming, Overedging and Shell Stitch Machines are



OUR CLASS 60 MACHINES for Trimming and Overseaming in one Operation produce the strongest, best Seams and do it with the greatest economy.

USE STYLE 18 for Horse Blankets.
STYLE 17 B or 22 for Bed Blankets.
STYLE 35 E SHELL, for Necks and Fronts of Rib Goods, produces the most showy, substantial finish.

Send for Catalogue and Samples.

THE MERROW MACHINE CO. HARTFORD, CONN.

Knickerbocker Building, Sixth and Arch Sts., Phila. 467 Broadway, cor. Grand St., N. Y.
815 West Van Buren St., Chicago, Ill. 1019 E. Baltimore St., Baltimore, Md.

Imported Knitting Machines of Quality

SPECIALTIES

Karl Lieberknecht, Oberlungwitz, Saxony

FULL FASHIONED MACHINES. "System Cotton" for plain and ribbed Hosiery, Underwear, Gloves and Neckties.

RIB MACHINES, high speed, for Rib Tops, Neckties, Hosiery in plain, striped and accordion effects.

WARP MACHINES **(150 COURSES PER MINUTE)** for Tricot Fabrics.

Otto Seifert, Burgstaedt, Saxony

WARP MACHINES, for Elastic Hat Bands, Mourning Bands, Shawls and Scarfs.

JACQUARD WARP MACHINES, for Veilings, Laces, Shawls, Insertions, etc.

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Sole Representative in U. S. and Canada

JAMES TAYLOR, 216 N. Front St. Philadelphia, Pa.

ALL KINDS OF NEW AND SECOND HAND **KNITTING MACHINERY**

A RARE OPPORTUNITY TO BUY

10 Lamb & Grosser Sweater Machines.
3 Large Crawford Hollow Plate Presses.
1 Allen 40 Spindle Cop Winder.
54 Standard "B" Knitters for sizes.
24 Mayo "Acme" " " "
2 Complete Hosiery Plants.
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1 Rotary Fire Pump. 3 Small Pumps.
2 Toque Machines.
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14 Cornely Hosiery Embroidery Machines.
500 Dozen Hosiery Shaping Boards.
1 Caligraph Typewriter.
1 Complete Plant for Mfg. Hosiery
1 ½ h. p. Electric Motor.
1 Singer Nat. Button-hole Machine.
500 Payne Winder Bobbins.
100 ¾ Aut. Knitters, various makes and sizes.
1 Payne 40 Spindle Skein Winder.
1 Abel 36 Spindle Cop Winder.
1 Union Special Overedge, Style 15.400.
4 Climax High Speed Motions for Ribbers.
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Lot Electric Stop Motions for flat Machines.
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30 Sweater Coat Machines various styles.
8 Jones Fleecers, 24x36".
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2 Singeing Machines.
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42 Union Spec. Sewing Machines, various styles
50 Loopers and Seamers, all makes.
60 Ribbed Underwear Machines.
100 Hosiery Ribbers and Sleevers.

WRITE FOR COMPLETE LIST. APPRAISEMENTS A SPECIALTY

We are always in the market to buy good Second-Hand Knitting and Finishing Machinery.

The Reece Button-Hole Machine

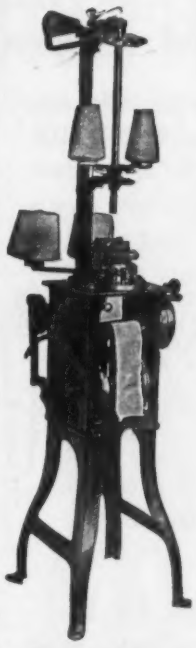
For Cutting and Stitching Straight Double-Barred Buttonholes

This machine is designed for cutting and stitching straight double-barred buttonholes without eyelets, from ⅛ of an inch in length up to 1 inch, in knit goods, shirts, shirtbands, collars, cuffs, etc., also on knit goods of all kinds. It is superior to all other machines, as it is the *only single thread* buttonhole machine on the market doing away with the bobbin or under thread, thereby making a great saving in the use of thread, and *it will produce more than double the quantity of work of any other machine*, thus saving the employment of an extra operator and the space of an extra machine. The quality of the work produced is superior to any other buttonhole, from the fact that the stitch is elastic, which is an important factor in knit goods. This machine is automatic in all its movements, and is an easy machine to handle, and does not require the services of a skilled operator, no cutting or pulling of the thread required, and when the buttonhole comes from the machine, it is finished in every respect and does not require to be trimmed or cut. The length of hole required can be obtained by simply turning a screw.

The machine is made of hardened steel drop forgings, thus reducing the breaking and wearing of parts to a minimum. *Samples of work and terms sent on application.*

THE REECE BUTTON-HOLE MACHINE CO.

Office and Factory - 500 to 514 Harrison Avenue, Boston, Mass



Ames Five-in-One

Leads the Knitting Machine Field in Simplicity, Adaptability and Productivity.

In its capacity to produce a large variety of styles—of superior quality.

At economical cost—this machine has no equal. Why?

Because it is, in effect

FIVE MACHINES IN ONE

We make some rather startling claims for this machine.

But we are prepared to guarantee them fully—

And to place the machine on trial and let it prove that you want it. Will you have full details—now?

The A. N. Ames Knitting Machine Company

Factory and Main Office, Main St., Franklin, N. H.

THE MOST COMPLETE LINE OF

Sweater Coat Machines

Automatic Racking Machines with or without striping attachments.
Herring Bone Stitch Coat Machines.
Plain Sweater Coat Machines.
Pineapple Stitch Sweater Machines.
Jersey Sweater Machines.
Plain Binding Machines.
Rotary Jacquard Binding Machines.

FOR INFORMATION, ADDRESS

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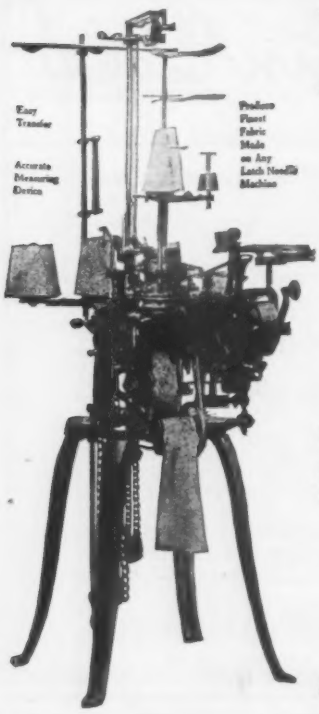
LITTLE FALLS, · NEW YORK, U. S. A.



What Knitters are Saying About the "P. & O." Machine

"We are running this machine beside another popular knitter on silk and art silk plaited hosiery. On the 'P. & O.' machine we are making less menders, a more even fabric and bigger production. In fact it is the best machine we have in our mill."

SAVES 10% ON YARN

Makes Ladies' or Half Hose; garter top; no ravel, silk plaited or mercerized leg; high splice, double sole; advanced toe; linen or mercerized heel and toe.

Write for full particulars

PAXTON & O'NEILL

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John W. Hepworth & Company

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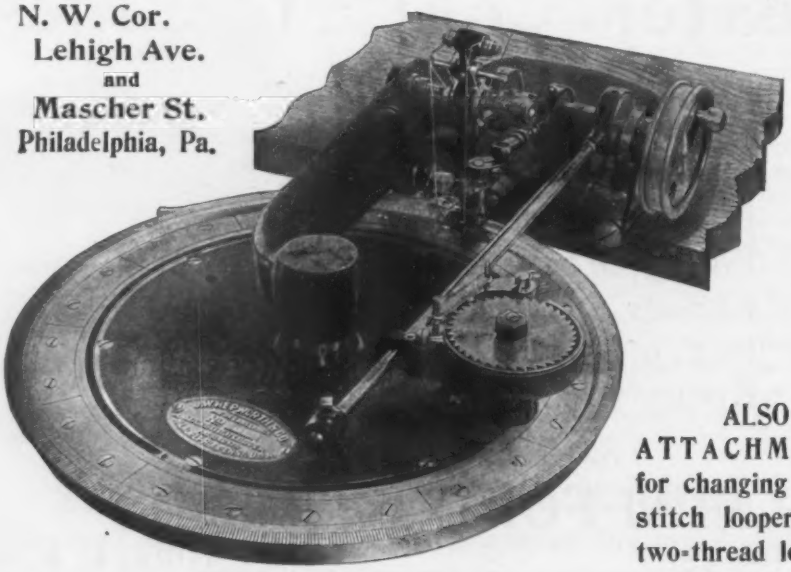

Makers of Two Thread Elastic Lock Stitch Loopers

ALSO
ATTACHMENTS
for changing our single stitch loopers into the two-thread loopers.

NYE & TREDICK CO.

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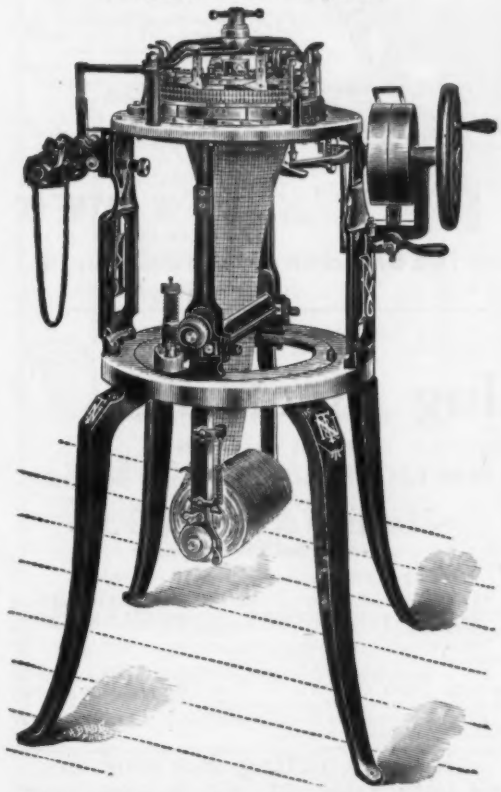


Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. Correct Construction, Excellence and Durability.

LATEST IMPROVEMENTS

Quality of Fabrics and Production
UNEXCELLED

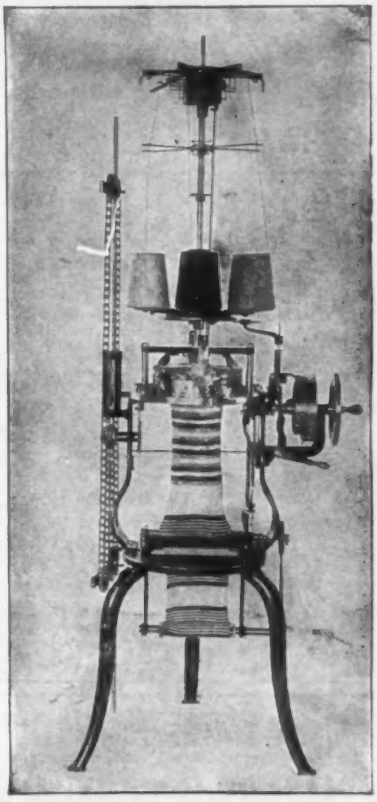
NYE & TREDICK CO.

191

CRANE MFG. CO.

Established 1870 — LAKEPORT, N. H. — Incorporated 1890

Spring and Latch Needle Machines
for both Rib and Plain Work
Economically Producing
A GREAT VARIETY OF FABRICS



IMPROVED AUTOMATIC
3-COLORED PLAIN STRIPER

Made in sizes from 7½" to 14½" inclusive, of any desired gauge; these measurements being back to back of cylinder needles.

The fabrics from this machine are used for bathing suits, theatrical and athletic goods.

These machines are second to none in the market.

The Crawford stop-motion is applied when requested.

SOME CRANE FEATURES.

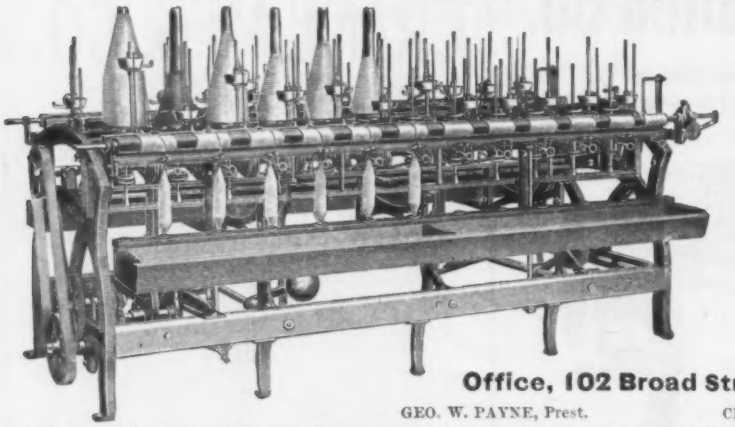
Patent removable hardened Wing Burr Wheels.

Patent Thread Stop Motion can be fitted to 20 in. and 40 in. frames and are specially adapted for making fine Jersey Cloth and Stockinet.

Our flat machine is adapted for knitting collarettes.

OVER 1,900 PAYNE WINDERS IN USE

By Hosiery Manufacturers, Wind for Cop, Skein or Bobbin



Improved

Upright Spoolers

To Spool from Cop, Skein or Bobbin

Doubling Spoolers for doubling 2, 3 or more ends into one

Upright Quillers, Quill from Cop, Skein or Bobbin.

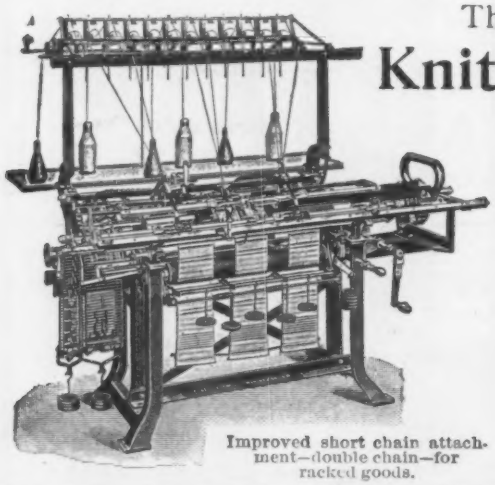
Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler Guides. Bolsters and Stops Made and Repaired at Short Notice.

GEO. W. PAYNE CO.

(Est. 1865, Inc. 1903.)

Office, 102 Broad Street, Pawtucket, R. I.

GEO. W. PAYNE, Prest. CLINTON F. PAYNE, Sec'y and Treas



Improved short chain attachment—double chain—for racked goods.

That is the Brand of the

Knitting Machines

worldwide known to be **The Best**

160,000 Knitting Machines in use all over the Universe

CLAES & FLENTJE

Muhlhausen Thr., Germany

(Largest Knitting Machine Factory in the World)

The cut represents one of our full automatic machines with double chain, short chain attachment, doing away with the long chain and lots of blocks.

Machines for all kinds of plain and fancy knit goods by hand and full automatic by power.

Our knitting machines are far superior to any other in simplicity and construction. They give a higher production than any other on the market.

For full particulars, needles and supplies for all kinds of knitting machines, write to

Ainslie Knitting Machine Co.

281 Ainslie Street **Brooklyn, N. Y.**

We Are the Oldest Manufacturers

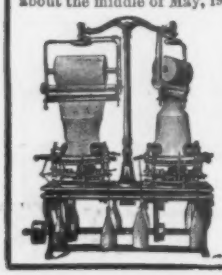
IN THE WESTERN HEMISPHERE

Of Circular Spring Needle Loop-Wheel Knitting Machinery.

TOMPKINS BROS. CO., Troy, N.Y.

We submit the following extract from the sworn testimony of R. W. Gormly, in U. S. Circuit Court, Northern District of New York, in equity, No. 6764:

Cross Question 123. How long have you been a manufacturer of knitting machines? Answer. I started in this business about the middle of May, 1900.



Tompkins Knitter

This design was adopted in 1875.

BUSINESS ESTABLISHED in 1846, before ROBERT W. GORMLEY Was born, according to his testimony in the case above cited.

New Jersey Wire Stitcher

Highest Grade

Machine for rapid and Economical Method of Attaching Labels to Hosiery or other Garments.

Uses pointed staples, cannot tear the finest fabric.

Send for Catalogue

J. L. Shoemaker & Co.
15 S. Sixth Street
PHILADELPHIA

STANDARD MACHINES FOR HOSIERY MAKING

The STANDARD F, with attachments, can make any and all of these fabrics:

- Plain Goods
- Plaited Work
- Three Color Stripes
- Tipped Heel and Toe
- White Foot
- Changed Heel and Toe
- Garter Top
- Loopers Slack Course

Most Stockings — Best Fabrics
Longest Life

Standard Machine Company

OFFICE AND SHOW ROOMS
330-348 North 12th Street
Philadelphia, Pa.

"ACME"
Hosiery and Textile Binder
No. 30

A Simple, Inexpensive Machine for Attaching Tickets on Hosiery, Underwear, etc.

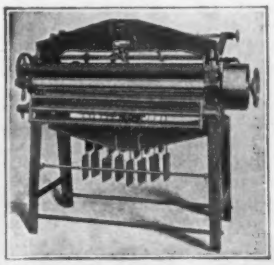
It uses a pointed staple, **CANNOT INJURE THE FINEST SILK HOSE;** can be set aside when not in use.

Is operated by foot power and has a **patented WORK-HOLDING DEVICE carrying one dozen or more pairs of hose, keeping them in perfect alignment and presenting the tops in position to receive the tickets AT LEAST TWENTY-FIVE PER CENT QUICKER** than by any other method now in use.

For particulars and the address of the nearest agency

Apply to the Manufacturers

The Acme Staple Company
Camden, N. J.



The "1912" Cloth Cutting Folding and Winding Machine.

This machine will cut down operating expenses. It does in one operation the work which is now being done in two. It cuts the cloth, folds the edges and rolls them up in one operation, and at all times gets one more strip out of a bolt of cloth than is possible with the old method of cutting. At the same time it measures the bolt of cloth to show the manufacturer whether or not he is getting the number of yards he is paying for. With the high price of cotton to-day every knit goods manufacturer ought to look into this to see if he is getting the maximum efficiency at the least expense. You will find when you come to figure it up in the course of a year that the labor it saves is a big item.

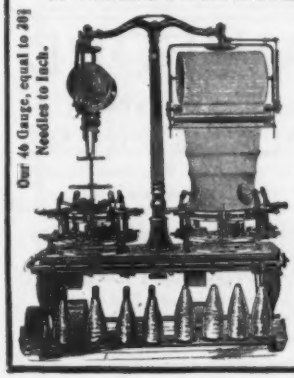
Also have other labor-saving devices, and upon application you can get prices and full information on same.

Joseph A. Firsching, 614 Broad Street Utica, N. Y., U. S. A.

We are the Oldest Manufacturers

WITH

45 YEARS PRACTICAL EXPERIENCE



in building Spring Needle Knitting Machines. Have succeeded knitting the finest and the coarsest work ever made on Spring Needle Knitting Machines in this country, any work from 3 to 46 gauge. Our Machine is of the highest class.

Robt. W. Gormly and Company,
Troy, N. Y.

THE LAMB

LEADER OF KNITTERS

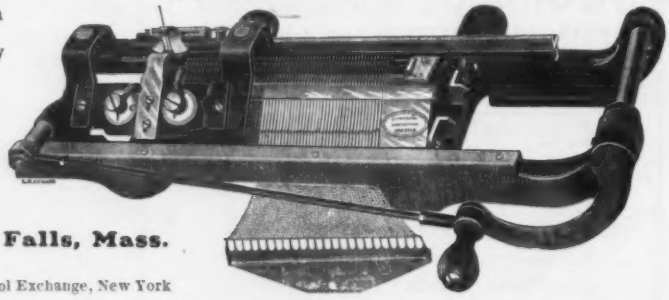
ORIGINAL AND STILL THE BEST

Most widely used; being operated in every civilized country.

Our Collarette Knitter Knits almost any conceivable style and with selvage ends.

Circular Rib Top and Seaming Machines.

Send for Prices and Catalog.



LAMB
Knitting Machine
COMPANY

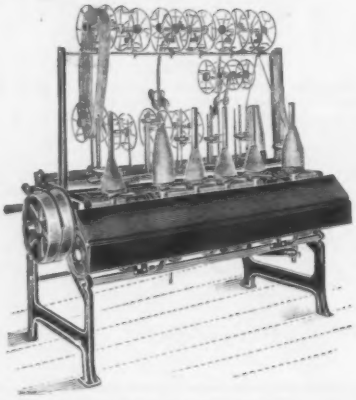
P. O. Box 5888, Chicopee Falls, Mass.

J. E. Woodhead, 124 East 22d St., Chicago.
L. D. Sanborn, Room 513, Wool Exchange, New York

A. W. ALLEN

2427 Mascher St., Phila.

WINDERS



6 SPINDLES UP

The best winder on the market. If you are not using one or more try one.

The Elastic Stitch Keeps the Buttons On

The Elastic Stitch Button Sewing Machine successfully overcomes button sewing troubles: Because

(1) **It does not pull the button down tight on the fabric.**

(2) **It leaves an allowance for thread shrinkage.**

(3) **Only one thread is used.**

(4) **There is no bobbin winding—no shuttle mechanism. No knives are used.**

(5) **It leaves a neat and uniform finish on EACH and EVERY button.**

The simplicity of operation insures reduced expenses and increased production. Let us demonstrate these facts to you.

Send for "List-of-Users" booklet

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Frederick Osann Company

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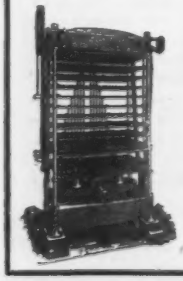
245 Seventh Ave. - - - New York City

Agents Everywhere

The CRAWFORD



HOLLOW STEAM

PLATE PRESS

For Knit or Woolen Goods

The most reliable machine of the kind on the market.

PRESS PAPERS and FENDERS

SPENCE & RIDEOUT

Successors to
J. J. CRAWFORD & SON
Established 1868 **NASHUA, N.H.**

CASE BROTHERS

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Highland Park, Conn.

Manufacturers of

RAG PRESS BOARDS

Especially Adapted to

Hot Pressing

Also
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Medals awarded at Paris and Melbourne Expositions.

Jacquard Cards

of all Grades for Fancy Weaving. Accurately Cut to Any Size.

"Acme" and "Hemphill"

SEAMLESS HOSIERY

Knitting Machines

built by

Acme Knitting Machine & Needle Company

FRANKLIN, N. H.

Answer all purposes in the *most reliable*, *up-to-date*, and *economical* manner. Write us for full particulars.

Manufacturers Like our Latch Needles

because we make a superior grade of needles

Philadelphia Office, Bourse Bldg.

Look At The Difference!

THE BREHMER STAPLE OF FINELY POINTED WIRE

The fine points escape the threads and do not break them. The staple ends lie perfectly flat and smooth and do not stick up to catch on other goods. The stitch is readily picked out with the fingers.

THE STITCH OF OTHER MACHINES USING THE HEAVY WIRE

The coarse heavy wire and the blunt staples break the threads and leave unsightly holes after they are removed and require a knife to extract the stitch.

Want a Circular?

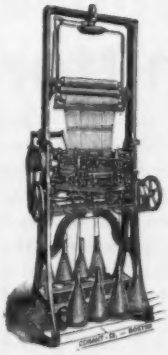
CHARLES BECK COMPANY

609 Chestnut Street, Philadelphia

CHARLES COOPER,

BENNINGTON, VERMONT,

MANUFACTURER OF



Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder, **Spring Needle Cylinder Rib-Top Machines** for making Cuffs, Drawer Bottoms and Shirt Borders.

Spring and Latch Knitting Needles,

Burr Wheels,

Burr Blades, Sinkers, Jacks, etc.

COLLARETTE ATTACHMENT

American Representative:
G. H. ROGERS,
838 Lancaster St., Albany, N. Y.

European Representative:
FELIX LEDERER,
1x/4 Schubertgasse, Nr. 22, Vienna, Austria.

HOW MUCH OF THIS

$10,000,000.00

DO YOU WANT?

About $10,000,000.00 worth of full fashioned stockings are made in America each year.

No matter what proportion of these millions you are now getting, you can get more of it if you will make full fashioned hosiery on our machines.

Because, the stockings you make will fit perfectly and bring you repeat orders.

The leading hosiery manufacturers are installing these machines.

If you are thinking of making full fashioned goods take up the question with us—as our success depends upon yours, we will prove to you that we can help you before you spend a cent.

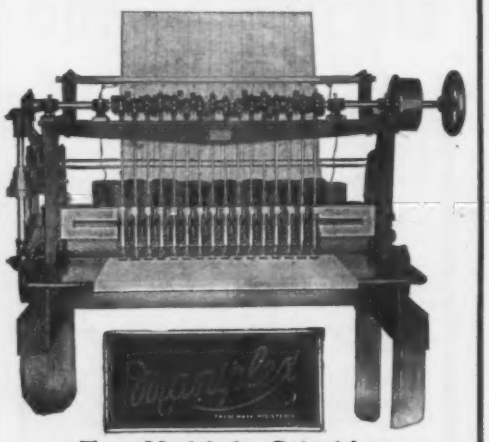
TEXTILE MACHINE WORKS

READING, PA.

THE MAKERS OF AMERICAN FULL FASHIONED HOSIERY MACHINES

CONTINENTAL LATCH NEEDLE CO.
NEW YORK
THE WORKMANSHIP AND QUALITY OF OUR GERMAN NEEDLES ARE UNSURPASSED OUR SCREW RIVET DOES NOT GET ROUGH OR LOOSE
LARGE STOCK OF NEEDLES FOR ALL AMERICAN AND FOREIGN KNITTING MACHINES
N.Y. OFFICE 120 LIBERTY ST.
WORKS, EBINGEN, GERMANY

"Maniplex" Sewing Machines



For Multiple Stitching

Built for all purposes where a number of rows of stitching are required. ¶With either form of stitch, single thread chain, double thread chain, or lock-stitch, sewing material from 1-16 inch thick, up to 1 inch thick, and up to 120 inch wide. ¶Furnished with any required number of needles, spacing to suit requirements. ¶We also build **Paper Slitting Machines** and design special machinery.

L. F. FALES

Walpole, Mass., U. S. A.

The New Boss Seamless Knitter

Do you want the biggest production with the least menders, for the least money? If so, write to the Boss Knitting Machine Works for their circular with full directions. There is no cylinder to be handled. We use only one cylinder and transfer device for half hose or ladies' hose. This machine beats them all. Has no equal for simplicity and durability. Makes 300 revolutions per minute. Built in sizes from 2¼ to 5½; from 40 to 224 needles. Automatic in heel and toe. It is the strongest built knitter on earth.

Send for prices and particulars.

THE BOSS KNITTING MACHINE WORKS,

Cor. Elm and Reed Sts., Reading, Pa.

STANDARD LATCH NEEDLES

Have You Tried Our Special Rivet?

Longer Wear, Less Mending, Better Work, Fewer Seconds.

STANDARD TRADE MARK.

Largest Manufacturers of Machine Needles in the World.

Excelsior Needle Co.

Torrington, Conn.

Agents

C. B. Baker & Co., Ltd., 140 West 22nd St., New York City
Manufacturers' Supplies Co., Cherry & Juniper Sts., Phila.
The Sewing Mch. Supplies Co., 121 Beach St., Boston, Mass.
Excelsior General Supplies Co., 813 So. Wabash Ave., Chicago
C. Shawl, 682 Mission St., San Francisco, Cal.
J. C. Strittmatter, Ave. San Francisco No. 29.
City of Mexico, Mexico

EXCELSIOR SEWING MACHINE NEEDLES

Highest Quality Crucible Wire, Smooth Eyes, Finest Temper, Hand Straightened.

WM. BREEDON'S SON

MANUFACTURERS OF

Spring Knitting Needles

AND BURR BLADES OF ALL KINDS

AMSTERDAM, N. Y.

EXCELSIOR NEEDLES

The Best Hosiery Needles in the market

Manufactured by

WARDWELL NEEDLE CO., LAKEPORT, N. H.

KEYSTONE LATCH NEEDLE CO.

JOHN C. EGLY, MGR. Manufacturers of

Patent and Regular Latch Needles

Needles for all makes of Knitters and Ribbers
Keystone Spring Bottom Needles for all makes of Knitting Machines always in stock for immediate delivery.
Special Needles made to order.

543 W. Lehigh Avenue, Philadelphia, Pa.

L. T. IVES CO.

ESTABLISHED 1874

Manufacturers of all kinds of

SPRING KNITTING NEEDLES

NEW BRUNSWICK, N. J.

John Eppler's Machine Works, 629 Filbert St., Phila., Pa.

LATEST IMPROVED UPRIGHT KNITTING LOOMS

For Millinery, Dress and Upholstery Trimmings and Netting

Steaming outfits for the finishing of knitted neckwear, etc.

W & G High-Speed Lockstitch Finishing Machine

This machine has shown its great **value for facing and finishing Knit Shirts and Drawers, for which it is especially adapted,** because of the neatness of its stitch and the greater economy in thread used when compared with the work of chain stitch machines. It is also superseding lockstitch machines of other makes on account of its superior work, both as regards quality and quantity.

CLAIMS

Lowest Maintenance Cost
Highest Sustained Speed
Largest Production
Perfect Stitches
No Vibration
Noiseless

An Investment—
Not an Expense

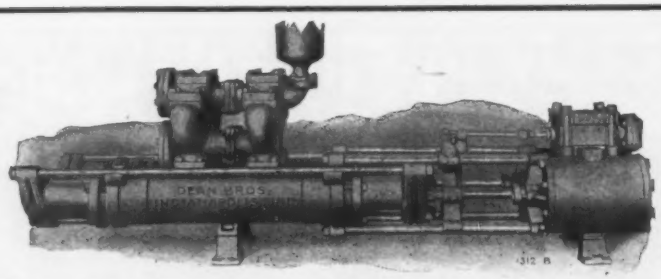
Willcox & Gibbs
Sewing Machine Co.

Chief Office: 658 Broadway, New York, N. Y.

3500 to 4000 PERFECT STITCHES per minute where factory conditions permit.

WILLCOX & GIBBS SEWING MACHINE CO. Ltd. London Nottingham Paris Dresden Brussels Milan

SEND FOR CAT. 92



BOILER FEEDER FOR 250 LBS. WORKING PRESSURE

New York Sales Office 30 Church Street

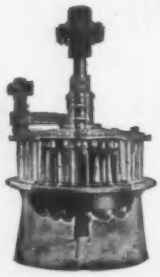
DEAN BROS. STEAM PUMP WORKS. INDIANAPOLIS.

NOT IN THE PUMP TRUST

THE SAMSON TURBINE WATER WHEEL

AND WHY IT IS BEST IN

POWER, SPEED AND ECONOMY



The Leffel Wheel, now developed into the Improved Samson Turbine, will continue to maintain, as it has for the past 49 years, its superiority because of features that give it wonderful power and high velocity, economy in the use of water, and an unusual steadiness of motion under variable gateage.

These are points of merit established by scientific and experimental tests.

Send for catalog illustrating and describing the different types and proving their merit

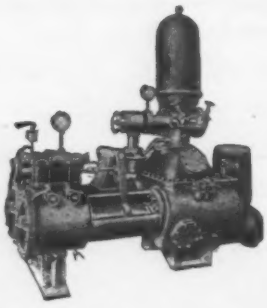
The James Leffel & Co.

502 Lagonda St. Springfield, Ohio

FIRE INSURANCE

is a splendid thing, but

Fire Protection is Better



The first will recoup your property loss, but a Blake-Knowles Underwriter Fire Pump will prevent the loss, not only of your property, but the business you cannot do while recovering from a fire. Be protected.

Write for Bulletin B K 881-52

The Blake & Knowles STEAM PUMP Works

Works: East Cambridge, Mass. New York Office: 115 Broadway

Branch Offices in all Principal Cities B240.2

NEW ENGLAND BUTT COMPANY

304 PEARL STREET, PROVIDENCE, R. I.

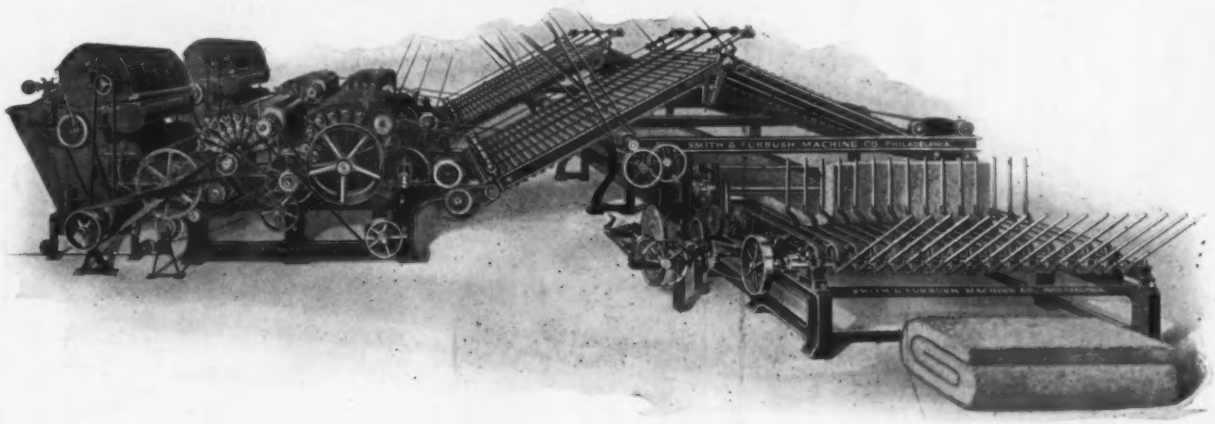
BRAIDING MACHINERY

ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS

SOLID SASH AND CURTAIN CORDS

SHOE AND CORSET LACES, BANDING

AND ALL BRAIDED FABRICS



Automatic Self-Feeder, Garnett Machine, Camel Back Lappers With Web Holding Device, and Automatic Cut-off and Folder

This illustration shows the automatic delivery head attached to cross apron and how the product of two or more garnetts or cards set side by side, can be deposited uniformly in regulated sheet layers on the one long cross apron. The garnetts or cards can be set in pairs opposite to each other if desired. We build a complete line of machinery for manufacturing felt for mattresses, comforts, upholstery work, etc., also for small rolls of commercial batting.

SMITH & FURBUSH MACHINE CO.

PHILADELPHIA

SMITH & FURBUSH MACHINE CO.,

PHILADELPHIA

Manufacturers of

PICKERS—Lumpers; Rag, Burr, Wool, Cotton, Jute, Fearnaught and Garnett Pickers; also Rag, Carpet and Jute Shredders.

WILLOWS—Continuous Cotton Stock Opening, Cleaning, Metal Extracting and Condensing Outfit; also Square Box and Cone Willows or Dusters.

GARNETT MACHINES—For carding cotton and woolen waste clippings, etc.; also for manufacturing cotton, wool and jute batting or felts.

FEEDS—Self-feeds for cotton, wool, worsted or jute; also Camel Backs, Blamires and Apperlys.

METALLIC BREASTS—Burring Machines and Self-Stripping Feed Rolls for Cards and Garnett Machines.

RECLAIMING MACHINE—For Opening and Cleaning various kinds of Cotton Mill Waste.

CARDS—Woolen, Worsted, Cotton Waste, Shoddy, Hair and Jute Cards; also Special Cards for the manufacture of Wool Hats.

MULES—Heavy and Durable for Wool and Waste Yarn.

TWISTERS—Plain or Fancy Twisters for Flake, Loop or Bourette Yarn.

BOBBIN WINDERS—Automatic Jack Bobbin Builder and Adjustable Creel for different length spools.

WARPING MACHINERY—Copper Cylinder Warp Dressers with single and double size pans; Beamers; Section and Pinless Warp Mills, Creels and Dresser Spoolers for Wool or Worsted.

GRINDERS, Etc.—Floor, Traverse and Portable Grinders for Cards, Garnetts or Rag Pickers; also Turning Rests, Fillet Winders, Card Stretchers and Cleaning Frames.

A complete line of Machinery for Manufacturing Gunny Bagging from Old Gunny Bagging; also for Manufacturing Mop Yarn and Rope from Cotton Waste.

Felting Machinery for Manufacturing Soft Felts or Commercial Batts, for Mattresses, Comforts, etc., made from Cotton Waste, Linters, Jute, Wool and Wool Waste.

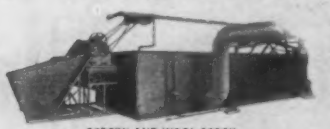
Special Circulars furnished for each Machine.

PROCTOR DRYERS

Formerly the "CYCLONE"

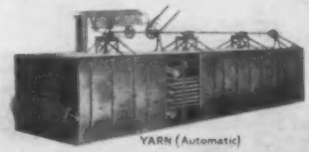
Fireproof

STOCKING



COTTON AND WOOL STOCK

TRUCK YARN



YARN (Automatic)

KNIT GOODS

Proctor Dryers of various types are being successfully used on all kinds of goods, handling the material at a very small cost per pound

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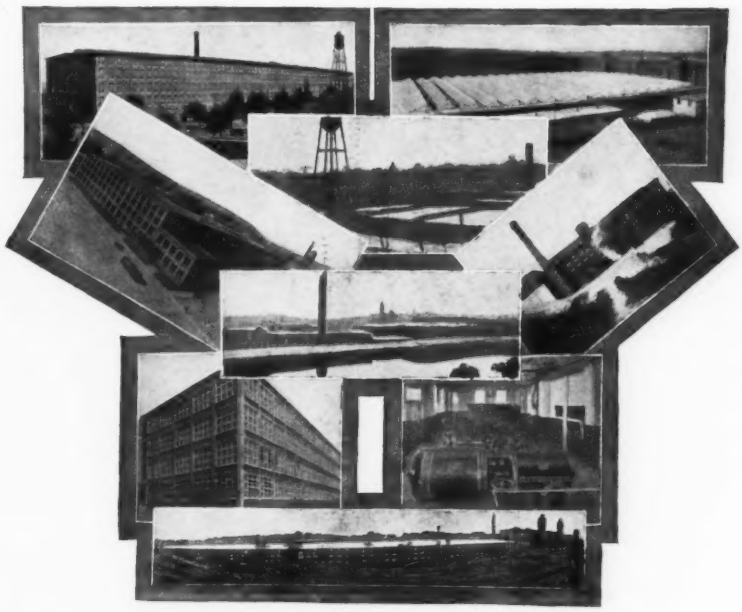
The Philadelphia Textile Machinery Co.

Philadelphia, Pennsylvania

H. G. Mayer, Charlotte, N. C.



G-E Mill Power Equipment
Predominates in 1913 Construction

A LIST of the important mill construction work during 1913 reads like a roll of General Electric Company's textile mill power equipment sales. There are good sound reasons for this preference shown at a time when industrial competition demands the utmost return from every dollar invested in productive machinery.

MILLS HAVING EXTENSIVE CONSTRUCTION WORK DONE IN 1913

Name of Company	Electric Power	G-E Equipt. Used	Name of Company	Electric Power	G-E Equipt. Used
Naumkeag Steam Cotton Mills	Yes	Yes	Crystal Spring Bleachery	Yes	No
Pacific Mills	Yes	Yes	Sterling Mills	Yes	Yes
Riverside & Dan River Mills	Yes	Yes	Columbus Mfg. Co.	Yes	Yes
Ludlow Mfg. Associates	Yes	Yes	Portland Woolen Mills		
Erlanger Cotton Mills	Yes	Yes	Cleveland Worsted Mills	No	No
Woodside Cotton Mills	Yes	Yes	Saxonia Dress Goods Co.	Yes	No
Lancaster Cotton Mills	Yes	Yes	Chalmers Knitting Co.	In part	No
Virginia Cotton Mills	Yes	Yes	H. C. Aberle	Yes	Yes
Dixie Cotton Mills	Yes	No	Moorhead Mills	Yes	Yes
Andrew McLean Co.	Yes	Yes	Sterling Knit Goods Co.	Yes	No
Cosmos Cotton Co.	Yes	Yes	Imperial Knitting Co.		
Lonsdale Mfg. Co.	No	No	Potter Knitting Co.	Yes	No
Empire Cotton Co.	Yes	Yes	Adrian Knitting Co.		
Hope Webbing Co.	Yes	Yes	Whitehead Hosiery Mills	Yes	Yes
Lincoln Mill	No	No	Russell Mfg. Co.	Yes	Yes

The textile mill power experts of the General Electric Company will be glad to show you how electric drive assists in meeting competition. This service is freely offered without implied obligation to buy. It is based on the experience gained in installing apparatus to apply 75% of the electric power used in the textile industry today.

General Electric Company

Largest Electrical Manufacturers in the World

Sales Offices in all Large Cities

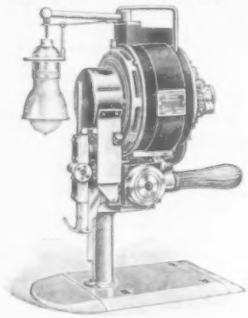
General Office: Schenectady N. Y. **District Offices in**

Boston, Mass. New York, N. Y. Philadelphia, Pa. Atlanta, Ga.
Cincinnati, O. Chicago, Ill. Denver, Colo. San Francisco, Cal.

MOTOR AGENCIES IN ALL LARGE CITIES AND TOWNS

4840

HEAD AND SHOULDERS above all other methods of cutting cloth stands the



EASTMAN CUTTING MACHINE

Many different models and types to select from assures you of getting just the machine for your needs.

Free Trial For All Styles

Straight knives Round knives For Direct or Alternating Current

THE EASTMAN MACHINE CO., Buffalo, N.Y.

NEW YORK, 816 Broadway. CHICAGO, 815 W. Van Buren St. PHILADELPHIA, 110 N. Sixth St.
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UNIVERSAL WINDING MACHINES

PARTS ALL INTERCHANGEABLE

THE NEW HOME OF "UNIVERSAL" MACHINES

UNIVERSAL WINDING COMPANY

PATENTEES AND **BOSTON** SOLE MANUFACTURERS

SIZOL—Is the sizing compound that makes the yarn feel like spun glass and also keeps it from being brittle. It gives the cloth a fine smooth finish.

SIZOL TRADE-MARK

Write for free trial sample

SEYDEL MANUFACTURING COMPANY

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Makers of Soap for Textile Mills